

Smithfield
Good food. Responsibly.

2016 Sustainability Report



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Welcome to Our 2016 Sustainability Report

This report provides comprehensive information on Smithfield's¹ sustainability progress and performance.

For the second year in a row, we are releasing our report in sections so that we can engage more deeply with stakeholders on a variety of topics. The full suite of content will constitute a "core" level report according to the Global Reporting Initiative (GRI) G4 Guidelines.

Our sustainability strategy is organized by pillars that represent our key areas of sustainability focus: animal care, environment, food safety and quality, helping communities, and people. The concept of value creation is an overarching focus of our sustainability strategy, underpinning these pillars.

Unless otherwise indicated, this report pertains to our U.S. and European operations and to investments in which we have a majority (51 percent or more) interest. We do not provide performance data for contract farms because they are independent businesses. We primarily use American measurement metrics and American numbering when reporting the performance of our U.S. and international operations.

We note changes in the scope of reporting or reclassifications of data previously reported, as well as other assumptions and bases for calculations in the relevant data sections. The content in this report primarily covers 2016.

Forward-Looking Information

This report contains “forward-looking” statements within the meaning of the federal securities laws. The forward-looking statements include statements concerning our outlook for the future, as well as other statements of beliefs, future plans and strategies or anticipated events, and similar expressions concerning matters that are not historical facts. Our forward-looking information and statements are subject to risks and uncertainties that could cause actual results to differ materially from those expressed in, or implied by, the forward-looking statements.

These risks and uncertainties include, but are not limited to, the availability and prices of live hogs, feed ingredients (including corn), raw materials, fuel and supplies, food safety, livestock disease, live hog production costs, product pricing, the competitive environment and related market conditions, risks associated with our indebtedness, including cost increases due to rising interest rates or changes in debt ratings or outlook, hedging risk, adverse weather conditions, operating efficiencies, changes in foreign currency exchange rates, access to capital, the cost of compliance with and changes to regulations and laws, including changes in accounting standards, tax laws, environmental laws, agricultural laws and occupational, health and safety laws, adverse results from litigation, actions of domestic and foreign governments, labor relations issues, credit exposure to large customers, the ability to realize the anticipated strategic benefits of the acquisition of Smithfield Foods, Inc. by WH Group, the ability to make effective acquisitions and successfully integrate newly acquired businesses into existing operations and other risks and uncertainties described under “Item 1A. Risk Factors.” Readers are cautioned not to place undue reliance on forward-looking statements because actual results may differ materially from those expressed in, or implied by, the statements. Any forward-looking statement that we make speaks only as of the date of such statement, and we undertake no obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise. Comparisons of results for current and any prior periods are not intended to express any future trends or indications of future performance, unless expressed as such, and should only be viewed as historical data.

¹ All references to “Smithfield,” “we,” “us,” and “our” are terms of convenience used to refer collectively to Smithfield Foods and all of its subsidiaries. Similarly, the terms “division,” “segment,” and “business unit” may be used to refer to one or more subsidiaries, which are independent operating companies.



Dear Smithfield Foods Stakeholder,

It is with great pride that I introduce our 2017 Sustainability Report. In it you will find a wealth of information about our industry-leading sustainability program. This report reflects our unwavering commitment to doing business the right way—the sustainable way.

Sustainability is firmly ingrained in our company's culture. One of the greatest things about doing business sustainably is that it is not just the right thing to do for our planet and its people; it is also the right thing to do for our own success as a company.

Our sustainability program truly sets us apart from our competitors. It is a differentiator like no other, both for our company and products. The things we do to strengthen our sustainability efforts also strengthen our position in the marketplace.

We are also incredibly proud of our agricultural roots and our role in feeding a growing population. But, because we are an animal agriculture company, we are targeted by a small, but vocal, minority who simply do not like our business. To be blunt, these groups sometimes spread falsehoods about our industry and either intentionally ignore or do not understand the increasing challenge of feeding a growing world population.

As someone who bears witness to the selfless dedication of the tens of thousands of Smithfield employees who work tirelessly every day to do things the right way, it is disappointing and frustrating to hear these claims. The fact is, I am proud of the role modern agriculture and our company play in providing safe and nutritious food to our growing world population.

A Year of Many Achievements

Indeed, with the release of each year's sustainability report, I find myself ever prouder of our accomplishments in honoring and caring for our animals, the environment, our communities, and our people. I also become more thankful for the remarkable efforts of our more than 50,000 employees who

bring our sustainability program to life, making us a better company. In 2017, we continued to grow and innovate, resulting in a wide range of accomplishments:

- We delivered on our 10-year promise of group housing for pregnant sows on company-owned farms. Today, all pregnant sows on company-owned farms globally, including our joint ventures in Mexico, are housed in groups. We were the first in the industry to make this commitment in 2007 and, since then, we have invested more than \$360 million to complete the transition.
- We launched Smithfield Renewables, a platform that unifies and accelerates our industry-leading carbon reduction and renewable energy efforts. Smithfield Renewables will lead us to achieving our ambitious goal of reducing greenhouse gas emissions 25 percent by 2025.
- We formed Smithfield Bioscience, taking a leadership position in leveraging byproducts from the meat production process for the development of pharmaceuticals, nutraceuticals, and medical devices. Over the last year, we have built relationships with pharmaceutical companies and several universities to further research and develop new biomedical technologies.
- We rolled out new programs to enhance and support employee safety as well as empower production employees to immediately report concerns or ideas for how to improve food safety and quality.

These achievements and others are the result of significant investments in our people and in the technologies and innovative processes that strengthen our position as the industry leader in sustainability.

A Company of Purpose and Principles

Guided by principles of responsibility, operational excellence, and innovation, we are rapidly advancing on our vision of becoming a world-class consumer packaged goods and protein company known for producing “Good food. Responsibly.®” We have found that success follows naturally when these principles are firmly upheld in everything we do.

And, we want to use our success to drive real change—change that can help solve local and global issues. We have remained steadfast in our social purpose of helping improve food security and end hunger by donating high-quality, nutritious food through our Helping Hungry Homes® initiative. We also provide philanthropic support for causes including education, veterans, and those that align with our sustainability program:

- **Hunger Relief**—Hunger and food insecurity unfortunately remain serious and often overlooked problems in the United States. As one of the nation’s leading food producers, we are especially well-positioned to contribute to hunger relief. Smithfield donated 21.1 million servings of protein to food banks and hunger relief organizations nationwide in 2017, contributing more than 100 million servings in total since 2008.
- **Education**—At Smithfield, we believe that education has the power to dramatically strengthen communities over the long run. Since its founding in 2002, the Smithfield Foundation, a nonprofit organization that serves as our company’s philanthropic arm, has focused on funding educational scholarships for children and grandchildren of employees, as well as other educational partnerships. In 2017, we provided scholarships for 144 students, totaling nearly \$660,000.
- **Supporting Veterans**—Part of Smithfield’s social purpose is to honor the service and sacrifice of American veterans and their families, mainly through partnerships with nonprofits that work directly with military families, as well as employee-led events that celebrate and support local veterans. We have stepped up our commitment to veterans with Operation 4000!—a Smithfield Foods initiative to employ 4,000 military veterans, or 10 percent of our domestic workforce, by 2020. Also in 2017, Smithfield donated \$68,000 to the Virginia Veterans Services Foundation to support state programs for homeless veterans in our headquarters state. The funding is going toward a unique private-public partnership that provides one-time gap assistance for homeless veterans in the process of being housed.

Always Looking Ahead

Our sustainability successes of 2017 fuel Smithfield for even greater things in the future. That is why we are continuing to dedicate our time, talent, and resources to these important efforts.

In the coming year, we will continue making significant investments that amplify our sustainability efforts, nearly tripling what we have spent historically in capital projects designed to optimize our operations.

In short, we will continue our relentless pursuit of new opportunities to improve the way we do business—both responsibly and profitably. As we persistently innovate to maintain our leadership position in sustainability, we remain committed to producing “Good food. Responsibly.®”

None of our achievements in sustainability would have been possible without the hard work and passion from our Smithfield family—our dedicated employees. They work daily to ensure we are making progress, meeting our goals, and fulfilling our commitments. To each of them, I offer my deepest appreciation and admiration. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read 'MS', is positioned below the word 'Sincerely,'.

Kenneth M. Sullivan
President and Chief Executive Officer

April 30, 2018



Dear Smithfield Foods Stakeholder,

Smithfield has long been a leader in sustainability, and we're proud of the many times that we have accomplished industry firsts.

The first to commit to convert to group housing systems for pregnant sows on company-owned farms. The first and only to report antibiotics use. The first and only to achieve ISO 14001 environmental certification for all of our farms and plants. The first and only to publish an online glossary of key food ingredients.

Just as we've set diverse benchmarks with sustainability "firsts" in the past, our approach will continue to evolve as we take leadership positions on key issues now and into the future. This past year saw another milestone—becoming the first in our industry to pledge to **reduce greenhouse gas (GHG) emissions** 25 percent by 2025.

We look at all of these commitments—and at our sustainability program as a whole—in relation to the value they create for our business and for our key stakeholders. One example is our partnership with Environmental Defense Fund (EDF) focusing on optimizing fertilizer use by independent grain farmers. **This project** is reducing GHG emissions across our supply chain, facilitating relationships with key suppliers, helping customers meet their own carbon goals, and increasing our local grain supplies for our animals. Our sustainability program is only sustainable if it is providing value for our business, for our stakeholders, and for the larger community.

Responsibility, Operational Excellence, and Innovation as a Driver of Sustainability

Our commitments also help inspire and engage our people to innovate and seek new solutions. More and more, we recognize that our employees want to feel a sense of purpose and responsibility, and these commitments help to provide that purpose.

This sense of purpose is now underpinned by our guiding principles of Responsibility, Operational Excellence, and Innovation. The work we do in

sustainability exemplifies these principles. In this year's report, which is being released in phases, you'll read about the inventive ways in which we plan to reach our new, aggressive GHG emissions reduction goal, including partnering with companies to [turn hog manure on our farms into renewable energy](#), and about how our hogs could play a role in regenerative medicine.

You will also read about how we're building a roster of new products that appeal to the latest trends in consumer tastes and shopping habits, from unique lines of prepared foods to products from [hogs raised without antibiotics](#). And you'll learn about how we're innovating in our manufacturing processes in ways that not only improve efficiency, but also improve safety for our people. A terrific example of this, which will be profiled in our report, is BladeStop™ technology we're installing on cutting room floors, which instantly shuts down when it senses contact with an individual's hand or finger.

Responsibility begins on our farms. At the core of our animal management program is a deep commitment to keeping our animals safe, comfortable, and healthy. Our animal scientists and veterinarians continue to study new ways to do that. We are constantly evolving our approach to stay current with the [latest in animal husbandry and science](#), from the types of feed we provide to the ways we transport our animals. We are also pleased with our progress transitioning pregnant sows to [group housing on company-owned farms](#).

And, of course, as a food company, one of our greatest responsibilities is maintaining the safety and quality of the products we make. This isn't something we take lightly, and we empower all of our people who work in our facilities to speak up if they see anything that could compromise our foods.

Greater Trust and Transparency

Since 2001, when we first began our sustainability program and publishing annual reports, we have seen a dramatic increase in such reporting across many industries. Most large companies now disclose sustainability data. In some places, it is becoming a [regulatory requirement](#).

Despite these changes, many challenges remain. In our industry, more and more people want to know where their food comes from and how it's made. They increasingly want to know how we are working to assure food safety, how we are improving our efficiencies, and how we are responsibly managing our resources. Interest in reporting on water is on the rise, particularly in industries like ours, which use a lot of it. Our sustainability program is helping to enhance our strategies and communication on these important issues.

We know that trust, transparency, and alignment of values are more important than ever to our customers and to our consumers, and we're committed to delivering on those qualities to ensure we are a company that consumers feel good about buying from—and a partner of choice for our customers. In short, we will continue to produce “Good food. Responsibly.®”

Sincerely,



Stewart Leeth
Vice President of Regulatory Affairs and Chief Sustainability Officer

May 2, 2017



We're the No. 1 U.S. Producer of Packaged Pork Products

Smithfield Foods, Inc., a wholly owned subsidiary of WH Group Limited, is the world's largest pork processor and hog producer. Sales exceeded \$14 billion in 2016.

In the United States, we are the leader in numerous packaged meats categories with popular brands including Smithfield®, Eckrich®, Nathan's Famous®, Farmland®, Armour®, Cook's®, John Morrell®, Gwaltney®, Kretschmar®, Margherita®, Curly's®, Carando®, and Healthy Ones®.

Headquartered in Smithfield, Virginia, our business operations are organized into four segments:

- Packaged Meats;
- Fresh Pork;
- Hog Production; and
- International.

The International segment is comprised mainly of wholly owned and joint venture operations in Poland, Romania, Mexico, and the United Kingdom.

Our products are sold to more than 3,800 customers in 44 countries on every continent (except Antarctica), including supermarket and hotel chains, wholesale distributors, restaurants, hospitals, and other institutions. We also sell to companies that further process our meats into consumer food products.

WH Group Limited, based in Hong Kong, trades on the Hong Kong Stock Exchange and has shareholders around the world. For more information on WH Group and its operations, visit www.wh-group.com.

Companywide Snapshot	2016	2015
Employees	50,702 ¹	50,236
Core Brands	13	13
Pounds of fresh pork and packaged meats sold	8.6 billion	8.5 billion ²
Market hogs produced	18.9 million	18.7 million
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Sales	\$14.3 billion	\$14.4 billion
Working capital	\$1.5 billion	\$2.2 billion
Net debt ³	\$1.4 billion	\$1.6 billion
Shareholder's equity	\$4.9 billion	\$4.8 billion
Net debt to total capitalization ⁴	23%	25%

¹ Workforce figure as of the end of 2016, prior to the acquisition of Clougherty Packing LLC, which added around 2,000 people to our employee total.

² The 2015 number was updated to include international sales.

³ Net debt is equal to long-term debt and capital lease obligations, including current portion, less cash and cash equivalents.

⁴ Total capitalization is equal to net debt plus shareholder's equity.



Our Goals and Sustainability Targets

Smithfield's goals and targets are designed to hold ourselves accountable to our peers, suppliers, customers, and other key stakeholders. We believe it's important to share our progress, including those areas where we need improvement.

In 2016, we announced an industry-leading goal to reduce greenhouse gas (GHG) emissions across our supply chain by 25 percent (by 2025). We will begin tracking our progress toward this in our 2017 report.

We consider a facilities-based target "achieved" for 2016 if 100 percent of locations have met the standard. Targets are noted as "on track" if they are less than 100 percent achieved but making appropriate progress.

KEY: **Achieved** | **On Track** | **Needs Improvement**

Animal Care GOAL: Keep animals safe, comfortable, and healthy

TARGETS

Each applicable facility to maintain a systematic program for animal care based on the North American Meat Institute’s (NAMI) Recommended Animal Handling Guidelines and Audit Guide.

Each farm division to continue to maintain and implement updates to the company’s Animal Care Management System and achieve annual audit score of excellent (97%–100%).

Smithfield to maintain U.S. Department of Agriculture (USDA) Process Verified Program (PVP) certification.

All live animal suppliers to be certified to Pork Quality Assurance Plus (PQA Plus®).

All live animal transporters to be certified to Transport Quality Assurance® (TQA).

Complete conversion to group housing systems for pregnant sows on U.S. company-owned farms by the end of 2017.

Complete conversion to group housing systems for pregnant sows on U.S. contract farms and in joint ventures worldwide by 2022.

Report antibiotic usage on an annual basis.

2016 RESULTS

100% of facilities maintained systematic programs.

All farms follow Smithfield’s Animal Care Management System. Average audit score for 2016 was 95.0%.

100% of plants maintained PVP certification.

99% of live animals were delivered by PQA Plus certified suppliers; 95% of supplier locations were site assessed.

100% of drivers delivering animals to processing plants were TQA certified.

87% of sows in company-owned group housing as of December 31, 2016.

100% of sows in company-owned group housing in Poland and Romania. Joint ventures in Mexico are working toward the 2022 goal.

Reported use for the past six years.

Environment GOALS: Reduce absolute greenhouse gas (GHG) emissions by 25%¹ over 2010 by 2025; reduce natural resource demand; 100% compliance, 100% of the time

TARGETS

From 2014 to 2020 (normalized):
 Reduce GHG emissions 5%.
 Reduce energy use 5%.
 Reduce water use 10%.
 Reduce solid waste sent to landfill 10%.

Reduce notices of violation (NOVs) to zero.

By 2018, 75% of grain purchased by Smithfield to be grown with efficient fertilizer and soil health practices.

2016 RESULTS²

Since 2014 (normalized):
 GHG emissions down 5.7%.
 Energy use down 14.5%.
 Water use down 3.3%.
 Solid waste down 2.3%.

Received 18 NOVs and \$6,500 in fines.

55% of grain sourced from fertilizer optimization program participants.

Food Safety & Quality GOAL: Deliver safe, high-quality meat products

<p>TARGETS</p> <p>No incident requiring USDA recalls.</p> <p>Maintain Global Food Safety Initiative (GFSI) certification at all applicable facilities.</p>	<p>2016 RESULTS</p> <p>Zero USDA recalls in the United States.</p> <p>100% of applicable facilities were GFSI-certified.</p>
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Helping Communities GOAL: Support our communities

<p>TARGETS</p> <p>Each facility/farm division to participate in four community events per year for charities/nonprofits. At least one event per year must include a stakeholder presentation.</p> <p>Each U.S. division to sponsor at least two Learners to Leaders® (LTL) programs.</p> <p>Maintain our Helping Hungry Homes® program donations of product to those in need.</p>	<p>2016 RESULTS</p> <p>100% of facilities/farm divisions met or exceeded target.</p> <p>100% of U.S. divisions supported at least two LTL programs.</p> <p>Donated 17.6 million servings of protein.</p>
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People GOAL: Reduce employee injury rates

<p>TARGETS</p> <p>Continue to reduce Total Incident Frequency Rate (TIFR). Maintain levels below general industry average.</p> <p>Achieve annual Days Away, Restricted, or Transferred (DART) results better than the general industry average.</p> <p>Increase safety engagement level to 30% of employees.</p>	<p>2016 RESULTS</p> <p>TIFR improved by 8%; 2016 rate was lower than 2015 national averages for animal slaughtering and processing industry, and slightly higher than national averages for all industries, including state and federal government.</p> <p>DART improved by 9%; 2016 rate was lower than 2015 national averages for animal slaughtering and processing industry, but higher than national averages for all industries, including state and federal government.</p> <p>Achieved safety engagement level of 47%.</p>
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¹ We will begin tracking progress to our new absolute GHG reduction goal in our 2017 report.

² We recently improved the way we track the amount of finished products being shipped from our facilities. Because this increased production totals, some normalized metrics—especially energy and GHG emissions—show considerable improvements, even though our facilities did not significantly reduce their resource use.



Measuring Our Performance

Smithfield believes transparency is central to ensuring accountability. Reporting helps stakeholders understand our performance over time and our performance relative to others in our industry.

Below are some key indicators we feel are particularly important to internal and external stakeholders, as well as to Smithfield as a company. Unless otherwise footnoted, 2014 and 2015 figures are reported by calendar year; data for 2013 and earlier cover our old fiscal year (May 1 through April 30). You will find additional domestic data in the relevant sections of this site.

Animal Care	2016	2015	2014	2013	2012
Sows in Company-Owned Group Housing (%) ¹	87.0	81.8	71.4	54.0	38.3
Antibiotics Used (milligrams per pound)	118	152	142	151	123
Company-Owned Market Hog Transportation Accidents ²	18	6	4	4	14

Environment³	2016	2015	2014	2013	2012
Greenhouse Gas (GHG) Intensity ⁴ (metric tons CO ₂ e per cwt ⁵)	0.0100	0.0098	0.0106	0.0145	0.0145
Energy Intensity (gigajoules per cwt)	0.094	0.091	0.110	0.124	0.121
Water Intensity (gallons per cwt)	61.7	61.4	63.8	76.2	79.5
Solid Waste to Landfill ⁶ (pounds per cwt)	1.27	1.27	1.30	1.85	2.36
Notices of Violation	18	11	18	17	29
Significant Fines	\$6,500	\$400	\$400	\$256,000	\$210,400
Food Safety and Quality	2016	2015	2014	2013	2012
Food Safety Expenditures ⁷	\$20 million	\$5.5 million	\$32 million	\$8.4 million	\$5.6 million
U.S. Department of Agriculture Recalls	0	0	0	2	1
Helping Communities	2016	2015	2014	2013	2012
Smithfield Foundation Scholarships	\$395,699	\$298,137	\$320,000	\$284,500	\$256,000
Learners to Leaders [®] Contributions	\$226,526	\$394,559	\$390,000	\$344,170	\$355,779
Food Donations (servings) ⁸	17.6 million	10.2 million	13.7 million	8.4 million	6.9 million

People ⁹	2016	2015	2014	2013	2012
Total Incident Frequency Rate (TIFR)	3.75	4.08	3.45	3.47	3.42
Days Away, Restricted, Transferred Rate (DART)	2.65	2.90	2.48	2.53	2.22
Days Away from Work Illness and Injury Rate (DAFWII)	0.75	0.79	0.64	0.73	0.65
OSHA Notices of Violation	29	11	45	31	67
OSHA Penalties	\$47,594	\$49,095	\$243,840	\$149,210	\$320,800

¹ All sow housing figures are reported by calendar year.

² In 2016, these 18 accidents resulted in the deaths of 555 hogs. Overall, 85,513 truckloads of company-owned hogs were transported from farms to processing plants. All of the 2016 accidents resulting in hog fatalities involved third-party contract haulers, which Smithfield hires to transport our animals between farms and processing plants. We are working with these trucking companies and their employees to provide help and training that we hope will decrease the number of incidents in 2017.

³ Data for 2012 cover the periods from May 1–April 30. Figures for 2013 and later are reported by calendar year. Notices of Violation and significant fines are reported by calendar year. As a result of improved reporting practices, we have restated 2014 and 2015 normalized figures for emissions, energy, water, and solid waste.

⁴ GHG totals do not include hog production operations.

⁵ CWT equals 100 pounds of product.

⁶ Solid waste totals do not include hog production operations.

⁷ Food safety expenditure totals are conservative and do not capture all food safety-related upgrades.

⁸ After publication of our 2015 report, we restated the amount of food donations for the year to correct a miscalculation. We have centralized our tracking to more accurately reflect food donations for the entire company.

⁹ All people figures are reported by calendar year. Safety rates are calculated per 100 employees. After publication of our 2015 report, Smithfield revised our safety metrics upward slightly for the year: TIFR went from 3.99 to 4.08, DART went from 2.80 to 2.90, and DAFWII went from 0.76 to 0.79.



Our Commitment to Animal Care

As the world's largest pork producer, we have a responsibility to be the leader in animal care. We believe that Smithfield¹ plays an important role in guiding our industry toward even higher standards.

We have taken a number of bold steps that have placed us at the forefront of the hog production industry in the United States, from the conversion of housing for pregnant sows on company-owned farms to our position on—and our transparency around—the use of antibiotics.

Our Animal Care Goal

- Keep animals safe, comfortable, and healthy

Our Animal Care Targets

- Each applicable facility to maintain a systematic program for animal care based on the North American Meat Institute's (NAMI) Recommended Animal Handling Guidelines and Audit Guide
- Each farm division to continue to maintain and implement updates to the company's Animal Care Management System and achieve annual audit score of excellent (97%–100%)
- Smithfield to maintain U.S. Department of Agriculture (USDA) Process Verified Program (PVP) certification
- All live animal suppliers to be certified to Pork Quality Assurance Plus (PQA Plus[®])
- All live animal transporters to be certified to Transport Quality Assurance[®] (TQA)
- Complete conversion to group housing systems for pregnant sows on U.S. company-owned farms by the end of 2017
- Complete conversion to group housing systems for pregnant sows on U.S. contract farms and in joint ventures worldwide by 2022
- Report antibiotic usage on an annual basis

We have been making adjustments to our farms to improve the quality of life for the animals while making our business even more competitive for the future. Our robust Animal Care Management System, which guides the care of the hogs at every stage of their lives—from gestation to transportation to processing—promotes their safety and overall well-being. All company-owned farm employees, contract hog producers, and plant employees who work with live animals must follow Smithfield's Animal Care Management System, and we take steps to verify their compliance. We have a zero tolerance policy for animal abuse or mishandling.

All hogs that arrive at our plants, whether company-owned or not, are traceable to farm of origin.

Hog Production: 2016 at a Glance

- World's largest hog producer
- U.S. domestic sows: 891,000
- U.S. market hogs produced: 15.6 million
- Primary breeds raised: Durocs (sires); Large White, crossbred with Landrace (females)

¹ All references to "Smithfield," "we," "us," and "our" are terms of convenience used to refer collectively to Smithfield Foods and all of its subsidiaries. Similarly, the terms "division," "segment," and "business unit" may be used to refer to one or more subsidiaries, which are independent operating companies.

Value Creation

Treating animals with care isn't just the right thing to do; it's also the right thing to do for our business. The healthier our animals, the healthier our company.

Our animal care management systems, policies, and procedures are designed to ensure the proper treatment of our hogs. Our animal care performance can influence our reputation and the relationships we have with customers and consumers. It can also influence production levels: Healthy animals are more resistant to disease and gain weight faster, and healthy sows have larger and stronger litters.

Contract growing relationships provide opportunities for many hundreds of farmers to diversify their family farms, make investments for the future, and stabilize their incomes. We also create opportunities for thousands of grain farmers across the United States and internationally who grow corn, wheat, soybean meal, sorghum, and other feed that we purchase in huge quantities. We are one of the single largest consumers of U.S. feed ingredients in the world. We also purchase a wide array of non-traditional feed ingredients, such as bakery byproducts, distillers' grains, and wheat bran, which might otherwise end up in landfills.

By the Numbers	2016
Contract grower payments	\$358 million
U.S. grain purchases	\$1.49 billion
International grain purchases	\$134.6 million

As a vertically integrated company, we are uniquely positioned to deliver products that meet the demands of our customers in the United States and abroad. (We raise about half of the pigs needed to make our products.) Vertical integration allows us to adapt and make changes at a faster pace than others in the industry, enabling us to be responsive to customer requests in areas such as group sow housing conversion, antibiotics use, and pigs raised without ractopamine, which is important for some export and domestic markets.

Contract Growers and Suppliers

One of the keys to our success is the business relationships we form with independent farmers, whether they contract with us to grow our animals or contract with us to supply animals directly to our slaughter plants. Contract growing relationships provide a level of financial stability for the contract growers, offsetting volatile commodity markets.

Contract growers are an important part of our business structure, and they are as valuable to us as our own employees.



Contract growers, who are private landowners and independent farmers, are paid under agreements that typically run for multiple years. Smithfield assumes the market risks and owns the hogs. The growers are protected from market fluctuations and receive a predictable income stream.

The contract grower provides the following:

- A farm site that meets all the relevant local, state, and federal legal, regulatory, and permitting requirements;
- Animal production facilities that meet Smithfield's contract and animal care requirements;
- Day-to-day management of the farm; and
- Financing for the construction and operation of the farm.

We provide the following:

- All the animals to the contract grower;
- All the feed to the contract grower;
- Transportation of all animals to and from the grower's farm;
- Veterinary support services;
- Ongoing advice to ensure the animals are properly cared for; and
- A predictable and stable payment based on agreed-upon contract terms.

Another key to operational excellence is the business relationships we form with other hog suppliers from whom we procure nearly 50 percent of our market hog supply. We work with more than 1,050 suppliers of various production sizes to supply eight processing plants throughout the Midwest and East Coast.

These suppliers are also required to adhere to the following expectations:

- **Traceability.** All pigs must be traceable to farm of origin.
- **Transport Quality Assurance® (TQA) certification.** All truck drivers must be TQA certified. This is verified on each load.
- **National Pork Board's (NPB) Pork Quality Assurance (PQA Plus®) certification.** All key management personnel must have PQA Plus certification. All premises, including nursery units and finishing sites, must have site status through the PQA Plus program.
- **Common Swine Industry Audit.** Procedures should follow the elements that are described in the recently adopted industry audit standards, including, but not limited to, training programs and documentation of employees who have received training; setting up standard operating procedures as listed in the audit standards; documentation that the program is being monitored; and documentation of corrective action from findings.

Hog Ownership

Type of Farm	We Own Pigs	We Own and Operate Farm
Company-owned	✓	✓
Independent/contract grower	✓	✗
Independent/direct supplier	✗	✗

Animal Care Management

As the world's largest producer of pork, we raise pigs on approximately 500 company-owned farms in the United States alone.

In addition, we do business with approximately 2,100 [contract hog farms](#) (also known as contract growers or contract producers) that raise company-owned pigs in the United States. Meat processing facilities also purchase pigs from large numbers of [other producers](#).

Smithfield Animal Care Policy



Our Animal Care Policy, which applies to company-owned farms, contract producers, and processing plants, underscores our commitments to providing the following:

- Shelter that is designed, maintained, and operated to provide a physical environment that meets the animals' needs;
- Access to adequate water and high-quality feed to meet nutritional requirements;
- Humane treatment of animals that enhances their well-being and complies with all applicable laws and regulations;
- Identification and appropriate treatment of animals in need of healthcare;
- Use of humane methods to euthanize sick or injured animals not responding to care and treatment; and
- Internal and external (third-party auditing) resources to verify, enhance, and update current company practices.

Smithfield Foods has a companywide Animal Care Committee that ensures that our animal policies are properly implemented. The committee, which reviews the policy at least once annually, communicates the importance of the program throughout the organization.

(Our international operations have their own animal care policies, which are modeled after our domestic operations. See the [International Animal Care section](#) of this report for more information.)

Adherence to the Animal Care Policy is a condition of employment at Smithfield and a condition of agreements with contract producers. Contract growers found to be in violation of these agreements must take appropriate corrective actions. Those growers who fail to take corrective action or who are found to condone willful abuse or neglect of animals are subject to immediate termination. In the past 13 years, we have terminated contracts with 11 contract growers who did not manage their farms in accordance with their contract commitments and the standards we require. (We did not have any contract terminations in 2014, 2015, or 2016.) We encourage any Smithfield employee who observes neglectful or abusive behavior to anonymously contact our toll-free reporting hotline.

Biosecurity

Biosecurity, or procedures to prevent the spread of disease, is critical to our operations and to the safety of the animals. Our biosecurity policy covers the animal production process at individual farms, as well as the movement of vehicles, animals, personnel, and equipment between farms.

We have procedures to prevent contaminants from being brought onto farms, including a “shower-in” process before entering a sow farm. All employees and visitors must take a shower and change into clean clothing before entering the farm. A “shower-out” procedure is also required when leaving.

Equipment and supplies delivered to the sow farm must be disinfected prior to being allowed inside the farm complex. Additional biosecurity measures are taken on farms where we breed our genetic lines of males and females and at locations where semen collection for the artificial insemination process occurs.



The Animal Care Chain



All hog farms must adhere to the guidelines of the National Pork Board Pork Quality Assurance Plus (PQA Plus®) program. PQA Plus provides guidelines for proper care of animals to ensure optimal health and well-being. It includes on-farm assessments and third-party verification that proper care is being implemented. In addition, the Common Swine Industry audit verifies that we are following industry standards and that our farms are compliant with our Animal Care Policy.



All drivers who transport our animals, including contract and supplier drivers, must be trained and certified under the National Pork Board's Transport Quality Assurance® (TQA) program. TQA provides education and guidelines for transporters, producers, and animal handlers on all aspects of hog handling and transportation.



Animals are treated with respect at processing plants, just as they are when growing at farms. Each plant uses a systematic approach to animal care that includes the Smithfield Animal Handling & Welfare Quality Management Plan, a comprehensive training program, and internal and third-party audits.

Animal Care Management Requirements

To implement our Animal Care Policy and make sure that animals are properly cared for, we rely on a comprehensive system of internal and third-party policies, procedures, and auditing platforms. Some of the requirements are specific to our hog farms; others are expressly for our processing plants. We constantly assess these tools to be sure that we are following the latest science that promotes the most humane treatment of animals.

On Farms

All our farms are 100 percent compliant with the national Pork Quality Assurance Plus (PQA Plus®) program, which serves as the basis for the Common Swine Industry Audit (see glossary below).

Trained internal auditors conduct animal care audits at least once annually on company-owned farms. Our yearly target is for all seven of our farm divisions to achieve audit scores of excellent (97 percent or above). In 2016, three farm divisions met that goal, with another two ranking as “commendable,” and two others ranking as “good.” None scored below 92 percent.

External auditors, who are retained by Smithfield, conduct random, unannounced visits at company-owned farms to perform the Common Swine Industry Audit. About 50 company-owned farms are audited by these third parties each year, on a rotational schedule. The external auditors are looking at big picture issues and ensuring that our internal auditors are calibrated with each other. Smithfield has also hired external auditors to begin conducting audits at independent farms.

Internal Farm Audit Scores on Company-Owned Farms	2015	2016
Average Audit Score	95.3%	95.0%
Number of Audits	425	399

All farms are audited annually; in some cases, farms may be audited as groups, resulting in a lower number. A small number of farms were not audited in 2016 because there were no pigs present due to sow housing conversion, clean-ups, or other factors.

Common Swine Industry Audits Type of Farm	2015 Average Common Swine Industry Audit Score	2016 Average Common Swine Industry Audit Score
Company-owned	97.5%	96.36%
Independent/contract grower	92.8%	95.22%
Independent/direct supplier	91.9%	94.4%

At Plants

Our plant management system follows the standards set in the U.S. Department of Agriculture’s (USDA) Process Verified Program (PVP) and monitors several key aspects of production, including traceability to farm of origin, PQA Plus program adherence on farms, and Transport Quality Assurance® (TQA) status of livestock haulers.

Our programs help ensure that the animals that come to the plants were raised where management systems address health, animal well-being, and proper use of antibiotics.

A third-party company performs annual audits at our plants based on North American Meat Institute (NAMI) guidelines. In addition, all plants are audited multiple times a day by Smithfield employees and by the USDA, which has representatives stationed inside each of our locations; these audits are scored on a pass-fail basis.

Company-Owned Plant Audits

2015 Score	99.56%
2016 Score	99.50%

Animal Care Management Glossary

- **Smithfield Animal Care Policy.** Applies to company-owned farms, contract producers, and processing plants, underscoring our commitments to shelter, food/water, humane treatment, healthcare, euthanasia, and auditing.
- **Smithfield Animal Care Management System.** Smithfield created this system for our company-owned farms more than a decade ago in consultation with two of the world's foremost experts in animal behavior and handling. Our on-farm management system includes employee training and audits to make certain that our Animal Care Policy is adhered to and that any issues are swiftly corrected.
- **Smithfield Animal Handling & Welfare Quality Management Plan.** Used at all Smithfield processing plants, this plan reinforces our Animal Care Policy for the hogs that are brought to our facilities for slaughtering.
- **Common Swine Industry Audit.** Created in 2014 as a common audit platform for pork producers, packers, and processors. Audit tools build on the existing Pork Quality Assurance Plus (PQA Plus®) program. [Learn more.](#)
- **National Pork Board's (NPB) Pork Quality Assurance Plus (PQA Plus) Program.** An educational program representing the industry's commitment to continuous improvement of production practices. It addresses food safety, animal well-being, environmental stewardship, worker safety, public health, and community. [Learn more.](#)
- **North American Meat Institute's (NAMI) Recommended Animal Handling Guidelines and Audit Guide.** The Guidelines, which were revised in early 2017, were first developed by Colorado State University's Dr. Temple Grandin, who has provided Smithfield with her animal welfare expertise for many years. All slaughter facilities are audited, at minimum, once per shift using these guidelines by auditors who have been trained according to the standards of the Professional Animal Auditor Certification Association (PAACO). [Learn more.](#)
- **Professional Animal Auditor Certification Organization (PAACO).** PAACO's mission is to promote the humane treatment of animals through education and certification of animal auditors. The organization provides uniform minimum standards for auditors. [Learn more.](#)
- **Traceability.** The ability to trace our hogs back to farm of origin.
- **Transport Quality Assurance® (TQA) Program.** A framework that helps transporters, producers, and handlers understand how to handle, move, and transport pigs and the potential impacts of those actions on pig well-being and/or pork quality. [Learn more.](#)
- **U.S. Department of Agriculture's (USDA) Process Verified Program (PVP).** A third-party verification service designed to provide agricultural suppliers with labeling and marketing tools that assure customers of the consistent quality of the products they purchase. [Learn more.](#)

Training

All employees who work with livestock undergo animal care training. On farms, for example, new employees undergo training during an initial 90-day probationary period. These new workers must demonstrate competence in animal handling techniques and a thorough understanding of our Animal Care Policy before the probationary period ends. We provide written manuals and videotaped training programs in English and Spanish, along with on-the-job training and mentoring with experienced animal handlers. Regular training programs continue throughout an employee's career.

We routinely offer training sessions on animal care and handling guidelines for customers, universities, industry groups, and trade associations. We

also host annual training and instruction activities for the [Professional Animal Auditor Certification Organization \(PAACO\)](#), whose mission is to promote the humane treatment of animals through education and certification of animal auditors. PAACO provides uniform, scientifically sound standards to auditors through education, training, and codes of conduct.

Antibiotics Use

We believe “Good food. Responsibly.®” means providing people with safe food they are confident serving to their families. One way we honor that promise is through strictly controlled use of antibiotics to care for our animals and to provide consumers with the safest food possible.

We understand, however, that potential antibiotic resistance is a public health concern. That’s one of the reasons why we led the industry by voluntarily aligning our antibiotics policy with new U.S. Food and Drug Administration (FDA) guidelines in 2015—about 18 months before the federal requirement to cease using medically important antibiotics for growth promotion took effect.

Antibiotic use is an extremely complicated issue, and we want to help our stakeholders understand the nuances without oversimplifying the facts. Read more in the [Antibiotics Q&A](#).

Let’s Start with the Basics

In the context of our industry, there are two kinds of antibiotics: those used both in human and animal health (medically important antibiotics) such as penicillin, for example; and those that are only used in animal health (non-medically important antibiotics). We use both types of antibiotics, as authorized or prescribed by company veterinarians, to control, treat, and prevent disease. We do not, however, use medically important antibiotics to promote growth or for feed efficiency on farms.

At Smithfield, we use antibiotics to do the following:

- **Control disease.** We administer antibiotics to our animals for a limited period of time to reduce the chance of spreading a specific disease following exposure.
- **Treat disease.** We administer antibiotics to treat sick animals.
- **Prevent disease.** We administer antibiotics to healthy animals when they may be exposed to a particular disease that exists on our premises or is likely to occur.
- **Promote growth.** While we do not use medically important antibiotics to promote growth, we do use animal-only antibiotics for growth promotion and feed efficiency.

Our Commitment

Our robust animal health management program, overseen by staff veterinarians, unifies our commitment systemwide. It maintains judicious use of antibiotics to produce healthy animals and make our food supply safe. The independent animal suppliers we work with are encouraged to judiciously administer all medications as well. Our veterinarians ensure sound animal care practices and good nutrition, perform preventive health examinations, authorize or prescribe vaccines and antibiotics, and are proactive in assessing potential health threats.

Smithfield’s Antibiotics Task Force, a cross-functional group composed of employees from sales, marketing, hog production, corporate affairs, and food safety and quality, discusses antibiotics issues from a companywide perspective to find ways to maintain Smithfield’s responsible leadership position on antibiotics.

Preventive Management

All antibiotics used on our farms are pre-approved by a licensed veterinarian, and a written authorization or prescription is also required before they are administered to any animals. Antibiotics are administered under veterinary supervision after careful evaluation of groups of pigs, herd history, and diagnostic testing to determine the amount and type of medication necessary for the protection of pig health and welfare. Read more about [prevention](#).

Read about our new line of meat from animals that have never been given antibiotics.

Supporting Antibiotics Research

We have pledged \$1.4 million to support scientific studies on antibiotic alternatives at the Virginia Tech College of Agriculture and Life Sciences and the Virginia-Maryland College of Veterinary Medicine. Researchers are using the funds to investigate methods that enhance animal well-being and production efficiency in swine-rearing operations.

The contribution, which is being made over three years, pays for three projects that aim to improve animal health, reduce the use of antibiotics, and find alternative production methods for hog farming.

Smithfield veterinarians and other members of our animal science and technology team meet regularly with the university researchers to discuss the ongoing studies and collaborate on real world examples and implementation.



Employees who are responsible for using antibiotics are thoroughly trained to follow all applicable laws including the FDA's antibiotic usage policies and antibiotic withdrawal timelines.

Verifying the implementation of our policies on farms is extremely important. We keep accurate records to track use of antibiotics on farms and began publicly reporting antibiotics usage in 2007. Today we're the only U.S. hog producer to provide this information. And to ensure we're always improving animal care and providing high-quality, safe food, we conduct research to identify new technologies and procedures that improve animal health while minimizing antibiotic use.

Antibiotics Q&A

There is a lot of discussion surrounding the use of antibiotics in animal agriculture. Here are the answers to a few of the most frequently asked questions on this topic.

Is the use of antibiotics in animal agriculture regulated?

Yes. The use of antibiotics in animal agriculture actually helps to keep our food supply safe, since safe food comes from healthy animals. Also, by law, any person who administers antibiotics to animals used for food must adhere to the specific antibiotic's withdrawal time. The withdrawal period, which is established by the U.S. Food and Drug Administration (FDA), specifies the number of days that must pass after the last antibiotic treatment before the animal can enter the food supply. Moreover, FDA and the U.S. Department of Agriculture have a coordinated surveillance program to help ensure compliance.

What are the main uses of antibiotics in animal agriculture?

Antibiotics are used in animal agriculture for four main reasons: to treat sick animals, to control disease, to prevent animals from becoming sick, and to promote growth. There are also two main kinds of antibiotics: those used both in human and animal health (which some have termed “shared-use” or “medically important” antibiotics), and those only used in animal health. It is important to note that many of the antibiotics used in both human and animal health also happen to be the most effective in treating sick animals, which is why the ability to continue the use of these “shared use” medicines in animal agriculture is so important.

Without these medicines, veterinarians would be unable to effectively prevent or control animal diseases. This increases the risk that the animal could enter our food supply while it is not completely healthy, which may increase the risk to public health. It also would undermine our veterinarians’ ability to protect animal health and prevent animals from suffering from preventable diseases.

Many chicken producers are going to stop using antibiotics altogether in poultry production. Why can’t you do the same in pork?

There are biological differences between birds and pigs with regard to the immune system and production process. For example, chickens have a very short production cycle (five to six weeks) compared with pigs (five-and-a-half months), so they don’t have as long a time to be exposed to various disease agents. Even with this difference, it should be noted that only a part of the poultry supply is produced without antibiotics because it is more expensive, and when a flock requires antibiotic treatment, the chickens will be treated and sold as a conventionally raised product.

How are antibiotics used on farms?

We use several different categories of antibiotics, as authorized or prescribed by veterinarians, to control, treat, and prevent disease. We do not, however, use medically important antibiotics to promote growth or for feed efficiency with our animals. We have also voluntarily aligned our animal health policies with the FDA guidance for industry. Visit the [FDA site](#) to learn more.

All use of antibiotics is pre-approved by a licensed veterinarian, and a written authorization or prescription is also required before antibiotics are administered to any animal. Our production management team is thoroughly trained to follow all applicable laws including the FDA’s antibiotic usage policies and antibiotic withdrawal timelines.

Verifying diligence on farms is extremely important. We keep accurate records to track use of antibiotics and began reporting antibiotics usage in 2007. Today we’re the only U.S. hog producer to report this information.

Antibiotics Reporting

We report antibiotics use data based on the total active ingredient given to the pigs through feed, as well as via water and injections. For 2016, the total was 118 milligrams per pound. The amount of antibiotics used varies from year to year based on a number of factors including weather conditions, inventory decisions, type of antibiotic used (feed, water, or injected), and active ingredient concentration.

We have been working with others in our industry, as well as other stakeholders, to come up with a standardized approach to antibiotics reporting.

What is the best unit of measurement? What data would be most meaningful, and understandable, to the general public? These are the types of questions that we are working to answer.

Antibiotics Used

(milligrams per pound)



Data prior to 2014 cover the periods from May 1 through April 30. Data for 2014 and after are for calendar year. In 2013, we refined our metrics to provide a more meaningful, accurate measurement. In prior years, data were calculated based on quantities of only feed-grade antibiotic products purchased each year. These products, which are bought premixed, contain active ingredients (the antibiotic itself) and inactive ingredients (such as roughage and minerals), both of which vary widely depending on the manufacturer. The new metric is more accurate because it accounts for total active antibiotics ingredients only.

Antibiotics Regulations

Every antibiotic we use is regulated by the U.S. Food and Drug Administration (FDA). We comply strictly with all antibiotic withdrawal timelines, as established by the U.S. Department of Agriculture (USDA) and the Food Animal Residue Avoidance Databank.

Some countries, such as Japan, Russia, and several nations in the European Union (EU), require farms and suppliers to make specific adjustments to those requirements. We always adhere to the guidelines of those countries with which we do business.

Domestically, the USDA monitors meat and poultry to ensure that there are no antibiotic residues that exceed the safety levels established by federal agencies. The National Residue Program (NRP) tests animal tissues to monitor antibiotic residue. Research from the National Antimicrobial Resistance Monitoring System—a collaboration among the Centers for Disease Control and Prevention (CDC), the FDA, and the USDA—shows that antibiotic resistance in animal products and food-borne diseases has been steady or declining in recent years.

Using Antibiotics for Prevention

Antibiotics are used on hog farms in the United States for four main purposes: to control disease, treat disease, prevent disease, and promote growth. Recently, many groups have criticized our industry, claiming that we are administering antibiotics for disease prevention as a masquerade for growth promotion. At Smithfield, this is not the case. To assure stakeholders of this, we have developed the below definition of preventative use of antibiotics to clarify in greater detail what we mean when we use this term.

What does prevention mean?

The Food and Drug Administration (FDA) defines disease “prevention” as the “administration of an antimicrobial drug to animals, none of which are exhibiting clinical signs of disease, in a situation where disease is likely to occur if the drug is not administered.” The FDA regards “prevention” as a therapeutic and judicious application of antibiotics.

Why is prevention important?

Swine medicine is population and herd based, meaning veterinarians focus on diagnosing and addressing illnesses that threaten a herd rather than treatment of solitary animals. Treatment, control, and prevention of disease operates on a range of therapies rather than distinct types of therapeutic use.

Many common bacteria are present in all swine herds. These can emerge to sicken animals when they are more vulnerable—such as when pigs are relocated to new barns and when viral infections such as Porcine Reproductive & Respiratory Syndrome (PRRS) and flu are present in a herd. At these vulnerable points, bacterial infections can quickly emerge and spread to other animals.

Preventing disease in pigs and in swine herds, rather than relying solely on disease treatment, stops unnecessary illness, suffering, and mortality in pigs on farms. Forcing veterinarians to allow animals to become ill prior to instituting effective treatments will lead to poorer health outcomes and increase the total antibiotic use. This also increases the risk that the animal could enter our food supply while it is not completely healthy, which may increase the risk to public health.

What prevention is and is not at Smithfield.

Smithfield adheres to the FDA definition of prevention. Our aim is to reduce disease carriers in our herd and to prevent our animals from contracting a disease, which would then require additional treatment and potentially more use of antibiotics. Prevention is not a “catch-all” term disguising sub-therapeutic uses of medically important antibiotics for production purposes.

Examples of preventative antibiotic use within Smithfield.

Antibiotic use is just one of the many illness-prevention strategies we employ to protect our herds. Vaccinations, strict biosecurity protocols, and animal husbandry practices are among the first lines of defense in our herd health management plans. When antibiotics are used, we continually evaluate such usage based on diagnostics and testing. Examples of preventative use include the following:

- Administering antibiotics to most newborn pigs to reduce the incidence of umbilical abscesses and hernia development.
- Administering antibiotics to pigs when they enter a site already diagnosed with a disease challenge such as swine dysentery.

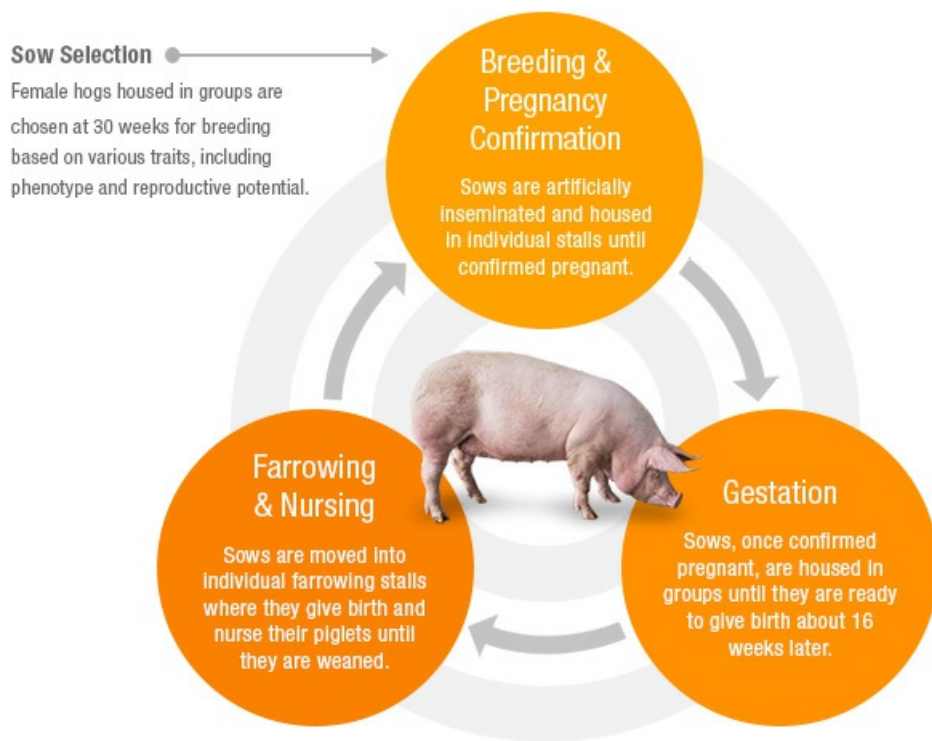
Housing of Pregnant Sows

(Updated January 1, 2018)

Our leadership in animal care is reflected in our successful transition of all pregnant sows on company-owned farms to group housing systems.

All pregnant sows on company-owned farms globally, including those in Poland, Romania and our joint ventures in Mexico, are housed in groups. Individual stalls are still used for breeding and farrowing.

Group Housing System for Pregnant Sows



In addition to the efforts at company-owned farms, we recommend that all of our contract sow growers in the United States complete a transition to group housing by the end of 2022. While the conversion of contract sow growers' facilities to group housing systems is being encouraged, it is not mandatory. If growers choose not to participate, their current contracts will remain unchanged, although extensions are less likely. We are providing guidance and expertise to contract growers when requested to help them through the conversion process.

Recent sow farm acquisitions will be converted to group housing systems in a timely manner.

Housing Systems

Generally speaking, Smithfield Foods' U.S. operations use three types of housing arrangements for pregnant sows: individual stall housing, free-access group housing, and small group housing. We have converted to free-access and small group housing at all company-owned farms. In doing so, we implemented more small group housing than free-access.

Individual sow housing. Historically used by most of the pork industry, this system puts pregnant sows in individual stalls for the duration of their pregnancies. This system allows for individual medical care and attention, minimizes fighting between sows, and allows personnel to monitor a sow's pregnancy more accurately.

Free-access group housing. In this system, a large group of sows (between 30 and 40) has access to a common area for lounging and exercise, as well as access to individual stalls for feeding. Sows can come and go as they please and can close a gate behind them in the stalls if they choose. On company-owned farms, we have observed that about 90 percent of sows choose to spend a majority of their time in the individual stalls rather than in the common area.

Small group housing. This form of housing allows small numbers of sows to be in a common open area once they are confirmed to be pregnant. These systems typically include individual feeding stations, which help to minimize fighting among sows for feed.



Improving Animal Care

As part of our efforts to maintain operational excellence, Smithfield's team of animal scientists and veterinarians is always looking for ways to improve the welfare of the animals in our care, and across the industry, from pain management in piglets to feeding strategies that minimize sow aggression.

Although controversial for some, we believe the procedures we follow make the pigs more comfortable during their lives and improve meat quality. The procedures, which include castration and tail docking, are consistent with our [Animal Care Policy](#).

The standards we follow are all approved by the American Association of Swine Veterinarians (AASV) and the American Veterinary Medical Association (AVMA).

Tail Docking and Pain Mitigation

We recently evaluated tail docking of piglets as part of our ongoing work to validate that we are doing what is best for the animals. In 2015 and 2016, we conducted scientific studies of the docking procedures, which occur when piglets are between 3 and 5 days old.

We learned that tail docking is important for pig welfare to prevent tail-biting behavior (and any resulting infections) later in the animals' lives. The studies showed that the procedure causes a very mild and short-term stress response at the moment of docking the tail. In the United States, there are only a limited number of approved pain relievers for use in piglets today; we found that none of the ones we evaluated was effective at reducing that mild stress response.

We believe the benefits of tail docking outweigh the brief and minor pain, protecting the animals from tail biting when they are older. We view this as similar to giving vaccines and flu shots to humans. At the time of the injection, there is a mild and short-term pain response, but we understand the vaccine prevents future illness or even death.

Caring for Animals During Market Transportation

Bedding or wood shavings are commonly put in trailers that transport pigs to provide warmth and footing for the animals. However, a variety of factors influence whether bedding—or how much bedding—is used, such as cleanliness of the trailer, season of the year, geographic location, and duration of the journey. The National Pork Board (NPB) provides guidelines on bedding amounts as part of its Transport Quality Assurance® (TQA) program but there is no scientific evidence to suggest that bedding benefits the animals or, conversely, that it is detrimental to pigs.

In order to improve our standards and processes, we measured the occurrences of animal slips and falls, particularly in cleaned trailers with no bedding in the warmer climates of North Carolina; we learned that the rate at which pigs slip and fall when unloading is minimal (below accepted industry standards). We are now evaluating new information that suggests bedding may not always be necessary, depending on factors such as season of the year and geographic location. In addition, using bedding only when necessary helps to improve our environmental footprint, since the bedding would otherwise go into a waste stream. (Bedding also makes the trailers harder to clean between loads and can cause biosecurity problems if not treated correctly.)

As part of our process improvements, our next step is to assess whether using bedding helps to reduce pig stress and injuries during all four seasons in the Southeast. In the meantime, we have shared our data from the trials with the TQA task force, which has changed its guidelines as a result.

Feeding Strategies

Another research effort related to our animal care standards focuses on improving our feeding strategies to enhance sow well-being, specifically in group housing. When sows are placed in group pens, some fighting occurs as the animals determine a social hierarchy. It's a natural part of sow behavior, and the animals need to work through their pecking order and determine who is the boss, who is submissive, and who falls in between. Competitive behavior during feeding time is another form of aggression that occurs in group pens of sows.

We conducted studies in 2016 to evaluate whether a change in feed could reduce the competition at mealtime for sows housed in groups. We added more fiber to the diets of group-housed sows (using a byproduct of ethanol production called Dried Distillers Grain with Solubles, or DDGS) to see if increased satiety (i.e., feeling full) would result in less competitive aggression. Our study aimed to determine if additional fiber could reduce hunger and therefore reduce competitive aggression and improve sow well-being, productivity, and longevity.

The studies showed that the added fiber did not reduce feeding time aggression. However, we learned something else in the process that proved valuable. We discovered that high volumes of DDGS in feed may pose a health risk to the sows—the result of a fungus that can grow naturally on the corn in the field. We have now modified sow diets to ensure that our feed does not contain any DDGS.

Genetics

As director of genetic research at Smithfield, Dr. Kent Gray has one primary aim: making a better pig.

That may sound like the stuff of science fiction. But what Gray and his team do every day is the genetics equivalent of matchmaking. They select animals from generation to generation, pairing them up to create the ideal descendants for that perfect rack of ribs or the tastiest smoked ham.

“We essentially play a version of Match.com with our pigs, figuring out which animals will make the best parents to produce the best offspring that will result in the best meat,” Gray says. “We take a lot of pride in the meat we produce, which is the result of years of genetics research and effort.”

The quality of Smithfield’s pork isn’t something that happened by accident. In facilities in North Carolina and Texas, more than 200 technicians, genetics researchers, and veterinarians look for new ways to improve the genetic traits of the animals, focusing on everything from a sow’s nursing skills to a piglet’s feeding abilities to the characteristics that result in the greatest flavor with the perfect amount of fat and marbling. We also select for specific genetic traits that will keep our animals comfortable and healthy.

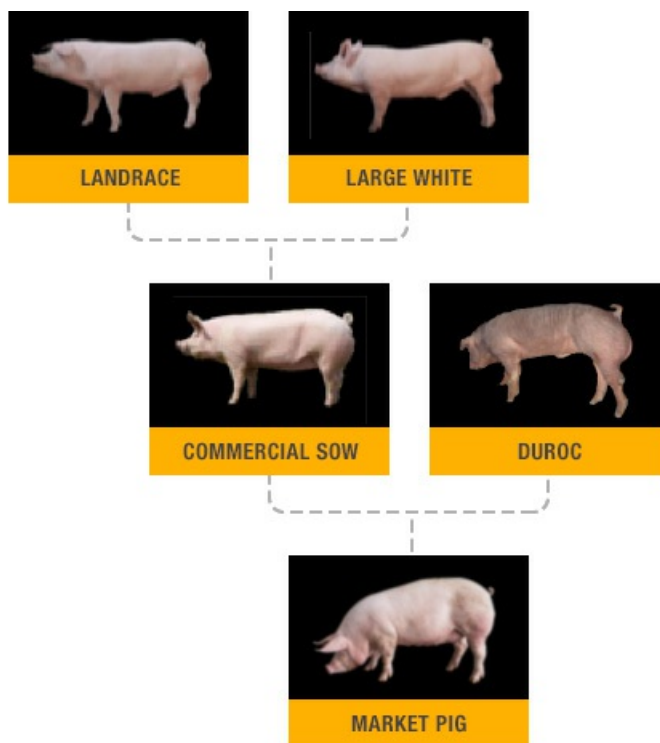
“We collect literally hundreds of animal traits and analyze them to determine which are the best ones for the next generation going forward,” says Dr. Justin Fix, director of the genetic programs. “We don’t want to exploit just one aspect to the detriment of other traits. This is about managing a whole host of objectives—growth performance, efficiency, tenderness, yield, as well as flavor.”

“We essentially play a version of Match.com with our pigs, figuring out which animals will make the best parents to produce the best offspring that will result in the best meat.”

— Dr. Kent Gray, director of genetic research

It’s important to note that we do not add or manipulate genes that are not normally found in a hog. Rather, we employ the science of genomics: taking millions of genetic data points about the animals and their environment and, with the help of sophisticated statistical software, calculating which ones have the gene characteristics we want to see in the next generations of hogs we will raise.

The hogs raised by Smithfield today are a combination of three heritage breeds: 100 percent Durocs on the male side and a 50–50 cross between Landrace and Large White hogs on the female side. Although the three lines are common worldwide, the hogs we have bred are unique within our industry. Our genetics program itself is also unique. Other meat companies in the United States use third parties to develop their breeding programs. Thanks to our vertically integrated research, we can literally trace the genetic lines across our entire pork chain, from breeding to farms to the final product.



We firmly believe that Smithfield hogs offer superior taste and eating experience. Moreover, the hogs also require fewer resources to raise, thanks to a targeted effort by our geneticists to identify characteristics that enable us to raise animals more efficiently. For example, in humans, some people gain weight more easily than others, the result of the genes they inherited. We want to produce hogs that gain weight more easily: Hogs that use calories more efficiently require less resources (and fewer days) to grow from infancy to market weight.

Feed efficiency is especially important as we look ahead to a growing world population that could put pressure on food supplies. We're researching how to produce high-quality, high-protein products that require fewer resources and, thus, have a smaller environmental footprint.

The swine genome became available in 2009 and is the primary tool we use in our work today. From that data, we were able to refine our abilities to capture DNA information and use it to screen animals that will parent the next generation. It typically takes three to four years before we see the selections we have made show up in the animals on our farms.

We also keep in mind biodiversity, so we can ensure a diverse population of hogs. In other words, we breed across familial lines.

Outside of their labs, the geneticists spend quite a bit of time educating Smithfield employees about what they do. "Pork University," which was later renamed "The Smithfield Experience," has trained thousands of Smithfield employees over the years, giving them insight into our breeding program and why it is so successful.

Genetically Modified Organisms

Meat and poultry livestock are not genetically modified organisms (GMOs). However, most of our animals are fed grains (including corn and soybeans) that may have used GMO technologies.

All GMO crops have been evaluated by a host of regulatory agencies, including the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA), as well as many scientific organizations, and have been found to be safe for people and animals to eat. There is no evidence that animals are affected by eating grain from plants with genetically modified characteristics.

At Smithfield, we monitor the dialogue about GMOs and stay current with the latest scientific research. We do not require any of our suppliers to be non-GMO.

Cloning

We do not produce meat products from cloned animals and have no plans to do so in the future. Although the FDA has concluded that meat products from cloned animals are safe for human consumption, the science involved in cloning animals is evolving. We will continue to monitor further scientific research on this technology.

We maintain our focus on the development and improvement of our meat products through careful selective breeding and genetic research, as detailed here.

Ractopamine

Ractopamine is a safe and effective U.S. Food and Drug Administration (FDA)-approved feed supplement that has been used by hog and beef producers for many years to produce leaner meat more efficiently. The supplement, which is widely used in the United States, can be part of a healthy, balanced diet for growing hogs.

However, a number of nations ban the use of ractopamine. China, Russia, and the European Union (EU) countries, for example, require third-party verification that pigs are not fed ractopamine. To meet this demand, we have leveraged our vertically integrated platform to produce pigs without using this supplement. Several Smithfield plants now produce meat from pigs that have never received ractopamine. We also have initiatives with our producers to let them participate in our “never fed ractopamine” program if that fits with their production capabilities, and we comply with the U.S. Department of Agriculture’s (USDA) Porcine Export Verification Program, “Never Fed Beta Agonists.”

Humane Euthanasia and Slaughter

There are times on farms when employees must humanely euthanize pigs—typically following injuries or illnesses.

Employees are trained by our veterinarians in accordance with the recommendations of experts, including the American Association of Swine Veterinarians (AASV) and the National Pork Board (NPB). In recent years, we have been reviewing our operating procedures around euthanasia to ensure that we are using the most appropriate methods, based on the size and weight of the animals involved.

We have invested in research to understand which techniques cause the least pain and stress to the animals and to their handlers. For pigs weighing less than 65 pounds, we use either carbon dioxide (CO₂), which causes painless loss of consciousness and death, or a device called a non-penetrating captive bolt gun, which administers a controlled blow to the head without breaking the skin, instantaneously rendering the animal insensible and causing a quick death. For pigs larger than 65 pounds, we use a penetrating captive bolt gun that fires a retractable metal bolt into the brain, resulting in insensibility and death.

According to the AASV, humane methods will achieve the following:

- Minimize pain and distress to the pig during administration;
- Cause rapid loss of consciousness; and
- Result in death quickly and consistently.

Slaughter Methods

Smithfield has led the U.S. pork industry toward a procedure known as CO₂ anesthetizing. All facilities use the Butina[®] CO₂ Backloader anesthetizer system. This allows the pigs to move slowly, in small groups, which is much less stressful for the animals and their handlers. CO₂ anesthetizing is very effective and produces higher-quality meat than the older, single-file, electrical stunning systems.

Safe Transportation

Transportation of animals from farms to processing plants is an important element of our animal care program.

All drivers who transport animals must be trained and certified under the National Pork Board's (NPB) Transport Quality Assurance® (TQA) program, which provides education and guidelines for transporters, producers, and animal handlers on all aspects of hog handling and transportation. It should be noted that TQA certification does not ensure or audit compliance with the provided guidelines. Each processing facility does audit transporters to evaluate key criteria for the safe and humane hauling of livestock.

In a typical year, between 80,000 and 90,000 truckloads of company-owned hogs are transported from farms to processing plants.

We comply strictly with federal animal transport time guidelines and have systems in place to maximize the comfort and safety of the animals. For example, strategically placed fans and water misters help maintain animal comfort in hot weather.



In a typical year, between 80,000 and 90,000 truckloads of company-owned hogs are transported from farms to processing plants. About 60 percent of those loads are hauled by our trucks and drivers.

Transportation Accidents Involving Market Hogs

Each year, millions of pigs are transported over many miles between farms and from farms to processing plants. The vast majority of those trips occur safely and without incident. Nevertheless, accidents do occasionally happen.

Our live-haul accident-response procedures are widely regarded by animal care experts as the best in the industry. We have five equipment trailers, known as “rescue units,” pre-positioned in key areas where our business activity is concentrated. These trailers are stocked with a variety of equipment, such as lights, penning equipment, saws, generators, and other devices that are needed when a truck carrying animals is involved in an accident. When an accident occurs, designated company employees are dispatched to pick up a rescue unit and bring it to the accident site. Our aim is to have a rescue crew arrive at an accident site within the first hour of the incident. We carefully monitor all of the rescued animals that are brought to a plant to make sure they have not been injured. Injured animals that are humanely euthanized do not go into the food supply.

Smithfield has engaged Jennifer Woods, a livestock handling expert from Alberta, Canada, to train emergency responders including firefighters, police, truck drivers, veterinarians, and livestock producers, on the best methods to humanely and safely work with livestock at the scene of an accident.

In her training sessions, Woods covers animal behavior, extrication, and euthanasia. A livestock trailer is set up at her training sessions so emergency responders can become familiar with the vehicle and how to safely enter the trailer to retrieve the animals.

“No other company in the world is as prepared to respond to motor vehicle accidents involving livestock as Smithfield,” says Woods, who calls our program “the standard for the industry in live-haul emergency response.”

We also look for new ways to improve transportation. For example, in recent years we have incorporated unloading doors with wide chutes on trailers at many plants. This reduces the stress as pigs exit the trailers.

Company-Owned Market Hog Transportation Accidents	2012	2013	2014	2015	2016
Total number of loads hauled	84,633	89,351	80,894	82,031	85,513
Number of accidents	14	4	4	6	18
Market hogs involved	2,234	713	710	1,030	3,366
Market hog transportation fatalities	695	66	234	190	555

All of the 2016 accidents resulting in hog fatalities involved third-party contract haulers, which Smithfield hires to transport our animals between farms and processing plants. We are working with these trucking companies and their employees to provide help and training that we hope will decrease the number of incidents in 2017. In 2014, we changed from fiscal year reporting to calendar year. Data prior to 2014 cover the periods from May 1 through April 30. Data for 2014 is for the calendar year.

Animal Care Policy

Smithfield¹ is committed to being the industry leader in animal care practices to assure respectful and humane treatment of animals, to produce wholesome food products, and to analyze our operations and practices, including internal and independent third-party audits, to ensure continual improvement.

All operations involved with the production or processing of live animals are required to provide the following:

- Comprehensive written animal care programs to ensure animal well-being.
- Shelter that is designed, maintained, and operated to provide a physical environment that meets the animals' needs.
- Access to adequate water and high-quality feed to meet animal nutrition requirements (production facilities) and in accordance with the Humane Methods of Slaughter Act 1978 (processing facilities).
- Humane treatment of animals that ensures their well-being and complies with all applicable legal and regulatory requirements.
- Identification and appropriate treatment of animals in need of care.
- Humane treatment of animals that meets or exceeds the requirements of the Humane Methods of Slaughter Act of 1978, and all applicable American Meat Institute Animal Handling Guidelines (processing facilities).
- Timely use of humane methods to euthanize sick or injured animals not responding to care and treatment.

Adherence to the principles of this policy is a responsibility and requirement of those who interact with animals that are owned or processed by Smithfield. Willful neglect or abuse of animals will not be tolerated and will result in immediate termination. Offenders may also be subject to criminal prosecution under applicable laws.

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Environmental Stewardship

For more than a decade, Smithfield¹ has worked to significantly reduce our water and energy use and the amount of waste we send to landfill. We're continuing to pursue challenging targets that call for even greater improvements, all while our business expands in response to increasing global demand for pork.

In 2016, we took our environmental stewardship efforts to the next level in what was widely heralded as an ambitious first for our industry: a far-reaching greenhouse gas (GHG) reduction goal across our entire supply chain, from feed grain to packaged bacon. We have pledged to reduce our absolute GHG emissions by 25 percent by 2025, which will cut emissions by more than 4 million metric tons (or the equivalent of removing 900,000 cars from the road).

“We are proud to lead the industry and set another first by launching an endeavor that is both environmentally beneficial and economically feasible. While we will have unique challenges meeting this goal as the world’s largest pork processor and hog producer, our size and scale also means that, if successful, we can make a significant, positive impact.”

— Smithfield Foods President and Chief Executive Officer Kenneth M. Sullivan

Our Environment Goals

- Reduce absolute GHG emissions 25% over 2010 by 2025
- Reduce natural resource demand
- 100% compliance, 100% of the time

Our Environment Targets

- Energy: 5% reduction over 2014 by 2020
- Water: 10% reduction over 2014 by 2020
- Solid Waste (Material to Landfill): 10% reduction over 2014 by 2020
- Grain Procurement: By 2018, 75% of grain purchased by Smithfield to be grown with efficient fertilizer and soil health practices
- Compliance: Reduce notices of violation (NOVs) to zero

The absolute GHG emissions reduction will be measured from a 2010 baseline; efforts that were already under way prior to our 2016 announcement will be included in the final results. All water, energy, and solid waste targets are normalized by production levels. Solid waste target does not include hog production operations.

“There is much work ahead for Smithfield to reach its GHG goal. Success will require collaboration with farmers and others in the agricultural industry. We encourage companies to follow Smithfield’s leadership to make ambitious commitments to improve air and water quality. It’s important that the private sector play a role in protecting our natural resources.”

— Environmental Defense Fund President Fred Krupp

A Value Chain Approach

For this year’s report, we have organized the Environment section to focus on our efforts and progress related to the four value chain stages of our operations listed below. Year-over-year data can be found in the [Performance Summary](#).

- **Agricultural supply chain:** assist farmers in optimizing fertilizer use and improving soil health through grain feed sustainability efforts
- **Hog production:** implement manure conversion and renewable energy projects
- **Processing facilities:** continue energy efficiency projects, such as equipment upgrades
- **Transportation:** optimize logistics networks to more efficiently track vehicles and shipments, limiting costs and emissions

Developing a Life Cycle Analysis

Developing an effective goal around carbon emissions required a firm understanding of our company's carbon impacts across our supply chain. Smithfield retained the University of Minnesota's NorthStar Initiative for Sustainable Enterprise (NorthStar) to provide the data, tools, and analytical expertise necessary to trace our agricultural supply chain in a truly meaningful way.

Researchers at NorthStar first started with a life cycle analysis (LCA) developed by the National Pork Board (NPB) several years ago. While this LCA pointed to the various "hot spots," or biggest impact categories, for GHG emissions, it only captured national averages, not any specific operations. The NorthStar team built upon it by applying a predictive corn and animal transportation model that used publicly available data to work backward into our supply chain. This allowed us to estimate emissions from the growing (including fertilizer production and use) and processing of corn used to feed our animals. That same model estimated the potential GHG impact of all farms that supply hogs to Smithfield facilities, and then tracked the impacts of transportation and energy use associated with primary processing. With NorthStar's model, we had more tailored estimates on the two largest "hot spots" of hog production: corn inputs and manure management. We also had regionally specific fuel mixes to make more accurate estimates for emissions from our processing operations.

Linking the movement of corn's embedded energy from farms to processing facilities made it possible to quantify the GHG footprint of our crop production. The researchers were able to measure the relative GHG impacts of our supply chain broken down by the specific regions where we operate, rather than by a broad national average.

As a result of the analysis, Smithfield can now focus our efforts on the elements of our supply chain where the highest emissions occur—not only by stage, but also by specific facility or operational segment as we aim to reduce emissions from 17 million metric tons of carbon dioxide annually to 12.75 million.

NorthStar's analysis broke down our GHG emissions sources according to the following groupings: grain farms and feed milling (20 to 25 percent); manure management (25 to 35 percent); consumers (20 to 25 percent); and other, which includes slaughtering, processing, and transportation (15 to 35 percent).

"As companies like Smithfield start to track and follow their carbon emissions, they can become efficient not just on price and transport and more 'typical' business things, but they can also become efficient with GHG impacts as well," says Jennifer Schmitt, the lead researcher with NorthStar for this project. "That's why getting the information, measuring it, and monitoring it is so important. Finding ways to maintain efficiency and reduce GHGs at the same time is exactly where businesses need to be going."

Schmitt says Smithfield has taken a leadership stance in the industry by committing to a 25 percent GHG reduction. It's important to note, she adds, that Smithfield can now look at the counties where corn production has the highest emissions. But if Smithfield stops buying that corn, someone else will buy it instead—which does nothing to reduce the GHG impact. Instead, she says, Smithfield is focusing on helping grain growers reduce their impacts, either by [switching to other crops](#) or by [working with farmers to reduce fertilizer use and harmful runoff](#).

Schmitt hopes others in the industry will follow suit. "It's important to get other players on board so there's enough market power to signal a demand for less carbon intensive corn," Schmitt says. "Change requires supply chains working together, and the ideal outcome is to incentivize counties that have the highest-carbon corn production to adjust their growing practices rather than just sell to someone else."

At Smithfield, we're considering the research conducted so far to be a work-in-progress. Moving forward, we'll be using their tool to track our progress toward our 2025 goal.

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Value Creation

Smithfield employees are doing their share to improve resource efficiency in countless ways, whether it is finding new projects that increase recycling, improve wastewater treatment, or reduce water consumption.

We also find ways to benefit from operational byproducts (such as hog manure, food scraps, and grease from precooked bacon) and underutilized resources (such as company land not currently used to grow crops or raise hogs). We strive for excellence, sharing innovative approaches across our operations so that employees can apply best practices at their facilities. Below are some examples of the value these efforts create for our company and our stakeholders.

2016 By the Numbers	Value	Volume
Materials composted	\$0	20,819 tons
Recyclable cardboard sales	\$1,498,787	27,288 tons
Biogas captured	\$1,088,311	242,787 gigajoules
Wind energy leasing	\$274,000	122 megawatts
Solar energy leasing	\$49,077	3 megawatts
Bacon grease sales	\$4,898,527	18,097 tons

Cardboard sales are estimated based on average per-ton income. Bacon grease sales are from precooked bacon facilities only and do not include grease extracted by rendering facilities or from wastewater. Biogas value represents savings from natural gas not purchased and is based on actual cost. Wind power contribution is estimated based on the percentage of the project located on our property.

We also track the costs and savings of sustainability projects as part of our [Environmental Excellence Awards program](#). Since 2012, we have saved an estimated \$178 million in operating costs through environmental awards projects.

Awards Program Impacts	2016
Number of projects submitted	181
Awards granted	10
Capital expenditures	\$22.2 million
Cost reductions (first year)	\$30.5 million
Water saved	327 million gallons
Natural gas saved	9 million dekatherms (dth)
Electricity saved	18 million kilowatt hours (kWh)
Material diverted from landfill	40 million pounds

Estimated savings are conservative because they only account for the first year of projects submitted to our Environmental Excellence Awards.

Learn more about how we're creating value in other ways: in our [grain supply](#), by [turning manure into energy](#), and through [transportation logistics](#), to name a few examples.

Agricultural Supply Chain

As our [greenhouse gas \(GHG\) analysis](#) highlighted, the feed for our animals accounts for a significant component of our carbon footprint: 20 to 25 percent.

Smithfield purchases an enormous amount of grain to feed our hogs: \$1.7 billion worth a year (or roughly 7.9 million pounds). Although we don't own the grain farms,¹ we have been working with farmers to help them use fertilizer more efficiently and switch to lower-input crops, such as sorghum—steps that have multiple environmental benefits. In fact, we have committed to engaging 75 percent of our grain sourcing supply—close to half a million acres—in sustainable farming practices by 2018.

Project Target

- By 2018, 75% of grain purchased by Smithfield (farmed on the equivalent of roughly half a million acres) to be grown with efficient fertilizer and soil health practices.

Progress to Target

- In 2016, 55% of our total grain purchases came from 327,735 acres of farmland participating in the SmithfieldGro Program and/or the Land O'Lakes' SUSTAIN™ sustainability platform.

Fertilizer is a critical tool for agriculture. But it is also one of the primary drivers of crop-related GHG emissions; on average, more than half of the nutrients applied to fields are not absorbed by crops in the year applied. The excess nitrogen can transform into nitrous oxide, a greenhouse gas.

Since 2013, we have collaborated with Environmental Defense Fund (EDF) to help farmers find ways to optimize fertilizer use and reduce related runoff on their farms. The SmithfieldGro Program, which began with inspiration from Walmart, offers free agronomy advice and the tools farmers need to produce the same amount of grain with less fertilizer and more efficient practices. Smithfield's on-staff agronomists travel to grain farms, demonstrating adaptations that will improve fertilizer usage and crop production.

The SmithfieldGro Program has been a win-win solution. Through more efficient fertilizer application and adoption of practices, such as cover crops, farmers can improve water quality, reduce GHG emissions, and boost soil health—all while increasing profits, too.

We are encouraging growers in our supply chain to adopt the Land O'Lakes' SUSTAIN™ sustainability platform, which aims to enhance on-farm conservation and production by improving nutrient use efficiency and reducing soil loss. The platform was developed by United Suppliers—a cooperative of 560 locally owned and controlled agricultural retailers who serve growers spanning 45 million acres in the United States and Canada—in coordination with EDF. (United Suppliers is now part of Land O'Lakes.) Smithfield was the first protein company to use this program.

To date, we have helped hundreds of grain farmers implement cover crops, nitrogen sensors, and other conservation practices on nearly 328,000 acres, primarily in the Southeast and, more recently, in the Midwest.

Our agricultural supply chain work recently received an added boost from the U.S. Department of Agriculture (USDA) Regional Conservation Partnership Program (RCCP): a \$500,000 grant for expansion in North Carolina. The RCCP will hand out funds directly to grain farmers who implement conservation practices such as establishing nutrient management systems, planting cover crops, and practicing conservation tillage. In addition, researchers from two North Carolina universities will study and measure the project's success while grower organization partners, such as the North Carolina Farm Bureau and the Soybean Producers Association, will work to increase participation in the program.

Promoting More Sustainable Feed

For more than four years, we have been encouraging farmers in the Carolinas and Virginia to grow grain sorghum (also known as milo) and winter wheat as alternatives to more traditional feed. Both are sturdy crops that offer excellent sources of nutrients for pigs. Moreover, they can cost less to grow and produce better yields than corn, particularly in drought-prone regions.

In partnership with universities and state agronomists, we are actively urging farmers who do not achieve profitable corn yields (or who farm on marginal soils) to switch to sorghum or to double-crop with sorghum after winter wheat. A \$2.25 million Smithfield grant to researchers at Virginia Tech College of Agriculture and Life Sciences, North Carolina State, and the North Carolina Biotechnology Center is supporting studies on farming management practices that best protect sorghum from disease and pests.

Growing more grains near our East Coast farms also reduces our dependence on Midwestern corn, which must be transported hundreds of miles by train to our hog farms, and saves us at least \$5 million a year. A "buy local" effort has also resulted in us purchasing more corn that is grown in North Carolina, saving an additional \$6 million that would have otherwise been used for transporting Midwestern corn to the East Coast.

Benefits of Alternative Crops

Grain sorghum and winter wheat have significant potential for increased production. Sorghum is naturally drought-tolerant, making it especially advantageous for hot, arid regions or areas with periodic water shortages. Sorghum's low fertilizer demand reduces the risk of nutrient leaching and, thus, soil and water pollution. In addition, sorghum has a relatively short vegetation cycle, which also helps reduce demand for fertilizers and pesticides.

Wheat is grown over the winter when rainfall in the Southeast is more plentiful. Sorghum and wheat grains can be grown on the same fields in the same year (known as double-cropping) to allow for sustainable intensification of production.

Smithfield pays sorghum farmers 95 percent of the harvest cash price of corn, making it an economically attractive alternative. Sorghum typically costs farmers less to produce than corn, yet they can make almost as much when they sell sorghum on the open market as they can make when they sell corn (even though sorghum yields can be slightly lower).

Several years ago, only 5,000 acres of sorghum were grown in the Carolinas and Virginia regions from which Smithfield buys grain. The amount planted each year varies based upon weather and market conditions. In 2016, planted acres totaled 61,000, with Smithfield purchasing about 50 percent of the production.

Maria Balota, an associate professor of crop physiology at Virginia Tech and one of the researchers working with Smithfield, came to the region from Texas about eight years ago.

"We grew a lot of sorghum in Texas, which is very dry, and I came here and couldn't believe how badly corn was affected by drought," she says. "I kept saying that farmers should try growing sorghum, but I was told that there weren't any markets available for the crop so nobody paid me any attention."

She was thrilled when Smithfield began its sorghum initiative. Now, Smithfield provides an outlet for farmers to sell what they grow. At the same time, new research has developed hybrids and improved management techniques that allow farmers to overcome diseases and other barriers.

Hillary Mehl, assistant professor of plant pathology at Virginia Tech Tidewater Agricultural Research and Extension Center, is working on a management guide that will provide sorghum growers with information about sorghum-specific diseases and how to manage them.

"The most economical and effective way to manage crop diseases is to rotate crops, so the more options farmers have to switch with, the greater their flexibility in managing diseases and parasites," she says.

Upgrading Feed Mills

Our direct relationships with local farmers continue to be an integral part of our business. For several years now, we have been investing in upgrading feed mills, which has provided a greater capacity to source grains closer to our operations. We also have been purchasing grain elevators, including two recently in Ohio. We now buy roughly 65 percent of our animal feed directly from farmers, compared with about 10 percent in 2010.

¹ While Smithfield does grow corn and other crops on land at our company-owned farms, the amount of grains produced represents only a small amount of the overall needs for our animals. We implement conservation practices at our own operations.

Hog Production

We have long viewed manure and the nutrients it contains as valuable resources, not as a waste stream. On our farms, we recycle nutrients in manure by applying lagoon effluent as fertilizer on cropland.

We are increasingly creating value from manure through innovative technologies while reducing potential impacts and maintaining our commitment to manage manure responsibly. (See [FAQs below](#) for information on how we treat and manage manure.)

For example, we have been partnering with other companies, as well as governments and nonprofits, to turn [manure into energy](#). Our biggest project to date is taking place in Missouri, where manure from 2 million pigs on nine Smithfield hog farms is being converted into [renewable gas](#). Smithfield aims to install these technologies on at least 30 percent of company-owned farms as we work toward our 25 percent GHG reduction target.

Water and Solid Waste

We use water on our farms for our hogs to drink and for sanitation, cooling, and housekeeping. But our most significant water usage occurs at our plants. Learn about water and solid waste (other than hog manure) in the [Processing section](#).

Turning Manure into Renewable Natural Gas

You know that old adage about making lemonade out of lemons? Rudi Roeslein is proving out his own variation with a \$120 million project that converts hog manure into natural gas.

His company, Roeslein Alternative Energy (RAE), began pumping renewable gas into the national pipeline for use around the country in 2016 in what has been billed as the largest manure-to-energy project of its kind.

Lagoons on Smithfield farms handle hog manure through a process of anaerobic digestion, creating organic material that can later be applied to crops as nutrient-rich fertilizer. Several years ago, northern Missouri experienced two consecutive years of historic rainfall, putting significant stress on the system.

To improve lagoon management, our farms began a trial program to install impermeable synthetic covers over the lagoons, allowing us to capture the clean rainwater (thereby preventing it from entering the lagoons). A majority of the captured rainwater is returned to our freshwater reservoirs, which serve as drinking water sources for our animals. Another benefit: The covers could also capture methane created by the anaerobic digestion process, which could then be converted into biogas for energy production.

Roeslein saw the potential for a partnership, pledging to pay for the lagoon covers and related specialized equipment in exchange for the rights to sell the resulting energy. The project is ultimately expected to produce about 2.2 billion cubic feet of renewable natural gas (RNG) annually, enough to provide electricity to nearly 53,500 homes for a year.

Generating Wind and Solar on Farms

Our farming operations in Milford, Utah, have plenty of idle, unused land. We have partnered with two renewable energy companies to make better use of all that open space while offsetting fossil fuel use.

Nearly 40 percent of a 305-megawatt (MW) wind power farm sits on our property, with turbines capable of producing 135 MW that can power about 68,625 area homes. The site has generated commercial power since late 2009. In addition, a 3.0-MW solar farm capable of providing electricity to roughly 500 households is located on approximately 20 acres of unused Smithfield land.

Together, these projects bolster the local power grid while generating lease income for Smithfield. We plan to expand these types of projects in the United States and internationally over the long term. We are also utilizing internal and external expertise to identify and optimize new energy sources.

“We have to figure out what we can do with manure to keep it in the cycle,” Roeslein says. “There are no silver bullets. But this is a small step in showing how to use these underutilized resources to produce energy and return everything that remains productively back to the landscape. Because that’s how nature really works.”

By late 2016, nearly half of the 88 lagoons—each close to 4 acres—had been covered (at a cost of about \$300,000 apiece), and RAE was sending RNG into the national pipeline. Duke Energy in North Carolina has agreed to purchase a portion of the RNG to help it meet clean energy requirements for power generation.

Already, the project has seen a number of benefits, including the prevention of about 400 million gallons of rainfall water from entering lagoons and the avoidance of 850,000 tons of greenhouse gas (GHG) emissions.

“Smithfield cannot operate significant energy projects efficiently on our own,” says Blake Boxley, director of environmental health and safety for our Hog Production Division in Missouri. “What’s so exciting about this project is that we’re providing the resources, but it’s the energy company that is providing the expertise and funding.”

A subsequent phase of the project will focus on restoring native prairie lands on Smithfield property. When harvested, grasses from the prairies will create biomass for methane generation while providing wildlife habitat for locally important species.

We have several other manure-to-energy projects at other Smithfield locations, although none approaches the size of the RAE project. Our facility in Sioux Falls, South Dakota, produces 305.3 million cubic feet of biogas per year. Our processing facility in Tar Heel, North Carolina, operates two 5.75-acre anaerobic basins with an average production of 20.4 million cubic feet of biogas. Renewable energy firm RES Tar Heel, LLC, has agreed to install specialized equipment that will convert the biogas to electricity. The project will begin distributing energy to the local grid by the end of 2017. In total, these facilities produce enough biofuel to power approximately 9,000 U.S. households for one year.

Improving Animal Efficiency

A few decades ago, farmers had to feed a pig four pounds of food in order to yield one pound of pork. Today's hogs, by contrast, require less than 2.5 pounds of food for every one pound of pork—a dramatic improvement in a relatively short period of time.

Such efficiencies, gained across the industry, don't just save money; less feed reduces the acres of grain needed to feed our hogs and leads to less manure that must be managed.

A series of improvements in large-scale hog farming have led to more efficient operations that have already positively benefited our carbon footprint. For starters, Smithfield's hogs are raised indoors in climate-controlled barns, which reduces illness and mortality.

Advancements in genetics have also enabled us to breed animals that grow heavier at a faster rate, reducing the amount of feed required from birth to market weight. Customized diets, meanwhile, have allowed pigs to grow and gain lean muscle while retaining more nutrients. Precise formulas of corn, soybean meal, wheat, and minerals and vitamins limit the nutrient levels in hog manure. All of these efforts have reduced the level of nutrients to be managed on our farms.

Our farming operations will continue to look for innovations in hog production that will help us raise animals more efficiently.

Nutrient Recycling Challenge

Innovative technologies that manage the nutrients in manure have the potential to improve water quality, support plant growth, and reduce greenhouse gas (GHG) emissions—all while delivering economic benefits to farmers. So far, however, development of technologies feasible for widespread adoption at existing operations across the industry has been elusive.

In 2015, we jumped at the opportunity to join the U.S. Environmental Protection Agency (EPA), other pork and dairy producers, the U.S. Department of Agriculture (USDA), and environmental and scientific experts to launch the Nutrient Recycling Challenge. This multi-phase competition brings together regulators, scientists, and industry experts to find affordable technologies that can extract valuable nutrients (such as nitrogen and/or phosphorus from hog or cow manure and concentrate them into a usable and marketable form).

In the first phase of the project, EPA received 75 concept papers on nutrient recovery technologies from applicants around the world. The 34 most promising entrants were invited to a summit in March 2016 where participants were able to share their knowledge around manure management, industrial application, regulatory needs, and funding opportunities. Out of those, the top 10 submissions were awarded a combined \$30,000 in prize money.

The EPA later asked those 34 summit participants to join in Phase II—a non-competitive incubation program aimed at moving the innovators from promising concepts to solid designs. Participants were expected to finalize their designs in the spring of 2017 and were awaiting the third phase of the project—a prize competition for building prototypes.

Smithfield is excited to see which of these technologies holds the greatest promise. Learn more about the [Challenge](#) and its industry partners.

Manure Management FAQs

We get lots of questions about manure management. So we answered the most popular ones below.

Do pigs wallow in their own manure?

Modern barns are often designed with slatted floors and routine flushing systems to remove manure from animal pens. This helps keep the animals cleaner relative to outdoor systems.

Where does the hog manure go?

The manure goes into several types of treatment systems that vary depending on several factors, including the location and type of the farm. The majority of our hog production operations use anaerobic treatment lagoons, which have been designed and certified by qualified professionals to treat and store the manure. Although the surfaces of the lagoons are exposed to the air, they are predominately anaerobic below the liquid surface. Lagoon sizes vary depending on the animal production on the farm. These lagoons allow the solids and the associated nutrients in the manure to break down naturally over a period of six to 12 months. Think of the lagoons as a “stomach” for a farm, where naturally occurring anaerobic organisms digest the materials. This treatment system can achieve up to 95 percent reductions in volatile solids and 85 percent reductions in biochemical oxygen demand (a common measure of the amount of oxygen necessary for bacteria to break down organic material in water). What remains is an anaerobically digested, low-solids effluent product that is highly suitable for use as an organic fertilizer and is applied for that purpose.

How are these treatment facilities managed?

Our Environmental Management System (EMS) requires daily checks on the status of all lagoons, weekly inspections, and regular internal audits. The results of all these efforts are recorded and reported to relevant agencies. We make sure that each company-owned farm has enough land available to utilize the manure to grow a variety of crops. Technical specialist staff prepare detailed and comprehensive nutrient management plans that specify the land area needed and types of crops to be grown. Land application systems are designed to ensure proper and precise application of these nutrients and are calibrated at regular intervals to maintain performance.

Are the treatment systems regulated?

The Federal Clean Water Act prohibits hog farms and other livestock operations from discharging manure or any wastewater to “waters of the state” at any time. All treatment systems on company-owned and contract farms require sign-off from state regulators, based on compliance with federally established standards, when they are built. In addition, hog production operations are regulated by state and/or federal water quality permits. These permits not only make comprehensive nutrient management plans enforceable under law, but they also require that we keep extensive records demonstrating compliance. Government inspectors visit hog production operations regularly (up to four times per year) to ensure compliance. Our internal requirements go well beyond regulatory compliance and record keeping; our EMS is certified to ISO 14001 standards.

Are there other location-specific regulations?

Yes. Local, state, and federal setback requirements ensure that hog farms are located in areas that minimize impacts to neighbors, as well as risks to local water sources. Setbacks vary, but examples include requiring farms to locate lagoons 500 feet from any public water-supply well and no less than 2,500 feet from schools, hospitals, parks, and other public spaces.

Are the anaerobic lagoons the best system available?

They are for certain locations and climates, but not in all places. We utilize a variety of manure management technologies, depending on regulatory requirements and regional climatic conditions. We have invested millions of dollars over the past 15 years to evaluate different manure management technologies and will continue to monitor emerging technologies. A few years ago, we sponsored research at North Carolina State University that analyzed 18 different treatment technologies; the researchers concluded that anaerobic lagoons are the best technology for existing North Carolina farms today.

What other types of systems does Smithfield use?

Lagoons aren't feasible in colder climates, so, in these locations, farms use specialized storage systems to maximize the nutrient content of the liquid manure, which is known as slurry. The manure is stored in tanks or in-ground concrete pits for eventual application to crops as slurry.

How does Smithfield ensure that manure applied to fields won't wash away with the rain?

Our farms apply the fertilizer at controlled application rates and only at times when ponding and/or runoff will not occur; detailed records of all applications are kept and inspected by state regulators. Employees must inspect the fields before, during, and after manure application to make sure that no runoff occurs. In North Carolina, for example, operators carry pagers that alert them to developing weather events and are required to shut down land application when developing weather systems are within 30 minutes of the farm. This precipitation alert system has been used in North Carolina for several years.

Is it better for the environment to raise hogs outdoors?

While some outdoor systems disperse manure across large areas, many outdoor animal producers locate hogs near creeks and have little or no containment to control manure runoff during rainstorms. In addition, untreated manure is deposited on the ground all year long. Modern production systems have storage systems so that manure does not need to be applied during rainstorms or in seasons when crops are not growing. Additionally, hogs grown outdoors generally do not grow as efficiently as animals raised in more controlled environments. As discussed above, any reduction in **animal efficiency** can increase overall greenhouse gas (GHG) emissions.

Processing

Our processing plants require energy, water, and packaging materials to produce fresh pork and packaged meats.

While processing makes up less than 10 percent of our greenhouse gas (GHG) footprint, recent energy reduction projects will help push us toward our [GHG reduction goal](#). Over the past several years, we have been upgrading plant equipment and streamlining production lines to reduce water use and improve [water quality](#) management. We have also worked to minimize the amount of solid waste sent to landfill. Some of our facilities have achieved [zero waste to landfill status](#).

Energy

Our processing facilities use significant amounts of energy in the form of electricity, fossil fuels, and biogas. We have focused on ways to use less energy in our operations and, when possible, are [generating renewable energy](#). We're also making some of our products less energy intensive for consumers. For example, we have increased the number of ready-to-eat, prepared foods such as precooked entrees, bacon, and sausage. This means our foodservice customers and consumers use less energy to prepare and enjoy our food.

We are aiming for our processing plants to achieve 5 percent reductions in both energy and greenhouse gas (GHG) emissions by 2020. Any GHG reductions at our facilities will contribute to our overall [25 percent by 2025 reduction target](#).

In 2016, we adjusted the way we track production volumes at our facilities to more accurately account for the amount of finished products being shipped out of the plants. We also updated our methodology for estimating our GHG footprint. As a result, we saw a 5.7 percent reduction in GHG intensity and a 14.5 percent reduction in energy intensity from 2014, even though energy use at our facilities has remained steady for the past few years.

Our Performance

- GHG intensity down 5.7%
- Energy intensity down 14.5%

See the [Performance Summary](#) for energy and GHG data.

Water

Our processing plants require water for cooking and for sanitation. Using too much is expensive and wasteful and could potentially affect local sources, particularly in areas where water is scarce. Improperly managing water quality can create numerous risks to our businesses.

This past year, we continued to see improvements in our water efficiency, with intensity down 3.3 percent over our 2014 baseline, even as overall consumption rose by 6.2 percent.

Our Performance

- Water intensity down 3.3%

See the [Performance Summary](#) for water use data.

Industry Leader in Water Management

Ceres, a nonprofit advocate for sustainability leadership, recently evaluated companies in four industries (packaged food, beverage, meat, and agricultural products) and examined how water risks might disrupt operations, limit growth, or increase agricultural input costs, and, therefore, affect the profitability and competitive positioning of food companies.

Small Improvements Lead to Big Water Savings

Like many other Smithfield facilities, our processing plant in Springdale, Ohio, had made water use improvements that would reduce water use. But the reductions were not sustainable.

It wasn't until plant managers set an ambitious 15 percent reduction target that real change began to occur. Beginning in the fall of 2015, a cross-functional team from across the Springdale facility spent several months analyzing water use, identifying 30 activities that were responsible for about 80 percent of the plant's daily water use totals.

"We've done many water initiatives over the tenure of this facility. But we realized we needed to find ways to manage water and sustain reductions for the long haul and not just on a short-term basis," says Bennett Russell, environmental health and safety manager for the plant, which employs about 470 people to make 185 million pounds of hot dogs, sausages, and lunch meats annually.

Unlike previous water savings initiatives, this time the team got far more people involved: engineers, sanitation workers, plant operators, quality control specialists, and food safety managers, to name just a few. Together, they implemented 27 changes to operations, equipment, or water use procedures.

For example, they discovered that they could cool hot dogs just as effectively by spraying an alternating mist, rather than using a constant stream of water. This saved more than 50 gallons of water per minute on just one production line. Other changes included switching out nozzles on spray systems to minimize the water output and adopting less water intensive sanitation protocols.

Within a year, the plant had reduced its water use by a sizeable 15 percent, or 18.5 million gallons. And with only minimal investments in new equipment, the team cut annual water costs by more than \$200,000.

The team continues to meet biweekly to hold themselves accountable and make sure that progress continues. The plant's wastewater management staff won a Smithfield [Environmental Excellence Award](#), donating the accompanying cash prize to the Cincinnati Children's Hospital Medical Center (\$1,500) and The Ronald McDonald House of Cincinnati (\$1,500).

The [Ceres' report](#) ranked Smithfield Number 1 in water management among leading meat companies. Companies were evaluated on 20 core aspects of water risk management, including policy development and data gathering, business planning and goal-setting, and stakeholder engagement and disclosure. Smithfield received 33 (out of 100) points. The next-closest meat-industry competitor got 12. This is a significant accomplishment given the water use challenges for agricultural businesses like ours.

Read our new [Water Policy](#).

Improving Wastewater Treatment Process

Each day, our facility in Clinton, North Carolina, harvests 10,600 hogs, and generates 1.3 million gallons of wastewater. The wastewater is treated at the Clinton facility before being sent to the city's water treatment plant.

Historically, we used sulfuric acid to manage the wastewaters' pH levels, a costly process that can damage equipment and, worse still, pose health risks to employees if they didn't take proper precautions. Facility managers worked for months with a third-party specialist to come up with an alternative treatment option that manages the pH using a coagulant and two specialized polymers instead of sulfuric acid.

The new treatment process meets the city of Clinton's requirements while simultaneously improving the facility's interior air quality, decreasing the risk of violations, and saving the facility more than \$330,000 annually.

Two additional Smithfield plants in Denison, Iowa, and Crete, Nebraska, have already begun making the switch in treatment systems. We continue monitoring their performance and are evaluating whether other facilities would benefit from the same technology.

The project garnered a Smithfield [Environmental Excellence Award](#). The Clinton team donated its winnings (\$3,000) to the nonprofit Sampson County Child Advocacy Center (CAC), which provides services for abused children.

New Brine Recipe Leads to Better Water Quality

Hams are one of the primary foods made at our facility in Kinston, North Carolina. Before being cooked, raw pork is injected with salty brine water to make the meat as flavorful and juicy as possible. But not all the liquid gets absorbed in the cooking process, creating a waste stream of unused brine.

This wastewater had to be sent to landfills, rather than to the local water treatment plant—a costly endeavor. We analyzed the process and determined that the corn syrup in the solution posed the highest environmental impact. Eliminating it would not only improve the quality of the resulting wastewater, it would also reduce costs without affecting the taste, flavor, and tenderness of the ham.

This new recipe saved \$2.7 million annually, reduced solid waste to landfill significantly, and eliminated wastewater discharge violations. For its efforts, the plant's staff won the company's [President's Award](#), donating its \$3,000 winnings to the Boys & Girls Club of Lenoir County.

Solid Waste

Smithfield seeks to be as efficient as possible when making and delivering products. Reducing solid waste at our processing facilities, and sending less of it to landfills, is an important part of our commitment to environmental stewardship.

Our approaches include redesigning packaging, increasing recycling and composting at our facilities, and selling materials that have residual value.

In 2016, our operations sent roughly 9 percent more material to landfills than in 2014 due to increased production. However, improved efficiency lowered the amount sent to landfill per 100 pounds of product (cwt) by just over 2 percent.

Our Performance

- Normalized solid waste to landfill down 2.3%

See the [Performance Summary](#) for solid waste data.

Zero Waste to Landfill

We encourage all domestic processing facilities to meet a rigorous set of criteria in order to be classified as zero-waste-to-landfill facilities. Doing so cuts waste disposal costs, generates revenue from selling recyclables, reduces emissions, and bolsters the company's reputation. Our eight certified facilities save nearly \$273,000 in disposal costs per year. At least 50 percent of total waste must be reused or recycled, and incineration without energy recovery is limited to hazardous wastes only.

To date, eight facilities have achieved zero-waste-to-landfill status:

Facility	Certification Date	Landfill Diversion (tons/year)	Savings
Peru, Indiana	May 2013	440	\$95,000
St. James, Minnesota	March 2014	1,306	Cost neutral
Bolingbrook, Illinois	June 2014	142	\$50,000
Springfield, Massachusetts	July 2014	242	\$66,000
Sioux Center, Iowa	February 2016	2,467	\$20,000
St. Charles, Illinois	March 2016	1,466	\$14,000
Mason City, Iowa	August 2016	889	\$24,900
Omaha, Nebraska	October 2016	350	\$2,900

Packaging

Product packaging helps ensure food quality and safety. It offers protection during transit, extends shelf life, and communicates important nutrition and safe-handling information to consumers.

We utilize a wide variety of packaging materials, including resin-based plastics, such as clear film and bags for sealing meats, and corrugated cardboard boxes for shipments. Other items include foam trays, plastic boxes, absorbent liners, folding cartons, zipper bags, plastic tubs and lids, and rigid plastic trays.

We encourage facilities to develop packaging reduction projects and to subsequently report their successful outcomes through our annual internal awards program. The best practices chosen for awards are shared throughout the company to encourage continuous improvement at all our locations.

For example, our plant in Middlesboro, Kentucky, packages 8.5 million ham steaks per year in film wrap. The purchasing team spent a year working with its vendors, looking for thinner wrapping options. After switching to a new film, the plant now sends 23 percent (109,000 pounds) less plastic to the landfill and saves more than \$110,000 per year.

The Peru, Indiana, facility makes precooked microwavable bacon on seven production lines, several of which have a dedicated packaging machine. In order to make the packaging process more efficient, three lines were consolidated into one high-volume machine that generated 20,000 fewer pounds of plastic film waste per year. The consolidation had other environmental benefits: We now have fewer machines to clean, which means a reduction in water use and a drop in chemicals needed to prepare the water for discharge to the local treatment plant. Overall, this project saves the plant \$717,500 per year.

Transportation and Consumer Use

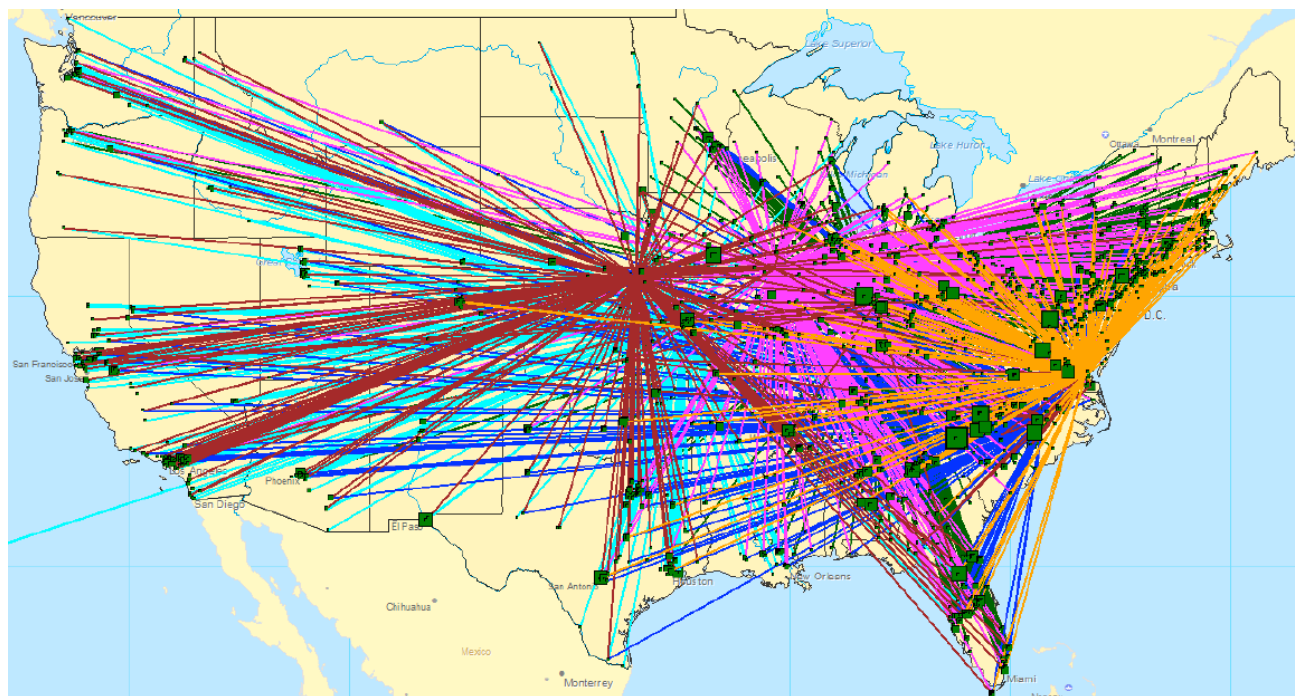
After processing, our products are transported to retailers and eventually make their way to the kitchens of consumers. Focusing on improving transportation logistics is a key element for reducing greenhouse gases (GHGs) because we have more control over emissions (in the case of our own fleet) or influence (in the case of contract truckers) than we do over how consumers use our products in their homes or workplaces.

Until recently, we operated three separate massive distribution and logistics networks. Transportation inefficiencies were the norm, creating millions of miles worth of redundant trips that expanded our environmental footprint and reduced profits. For example, pork bellies harvested in Tar Heel, North Carolina, might be turned into bacon in Milwaukee, Wisconsin, then driven back to the Southeast for sale at retail stores.

As part of our “One Smithfield” realignment, we began overhauling our logistics network, which includes a fleet of nearly 6,500 third-party trucks traveling more than 3 million miles a week, to find more efficient ways of producing our foods and getting them to customers (e.g., supermarkets, retail chains, restaurants, and foodservice companies). By reorganizing our logistics network, increasing weight on each shipment, and renegotiating carrier contracts, we hope to achieve several goals: eliminate redundancies, reduce complexities, lower operating costs, decrease our carbon footprint, and improve customer service.

Streamlining logistics is a substantial undertaking that will take years to complete, but initial projects are already showing great promise. Just a handful of changes made in 2016 lowered costs by \$20 million. These changes included an increase in shipping directly from our plants to customers (without staging products at distribution centers); a reduction in the number of trucks in our dedicated fleet; increased use of newer, lighter trucks; and renegotiated rates with our third-party trucking companies. In the next three to five years, we expect to reduce the distance Smithfield’s hogs and products travel by between 11 and 19 million miles, saving over 1.8 million gallons of fuel per year and an expected \$50 to \$60 million in total.

Distribution Current State



Distribution Future State



By switching to regional production hubs and streamlining our cold storage infrastructure, we will reduce the distance our products travel, which should lower fuel use, cut transportation costs, and improve delivery times.

Our Direct Store Delivery operations, which supply Smithfield products and other frozen food to retailers, haul nearly 200 million pounds of product to more than 15,000 stores each year. An analysis of their routes showed that many of our trucks were passing each other on the road, crossing into service areas covered by other branches. This inefficiency resulted in unnecessary miles driven, wasted fuel, and more time on the road for our drivers. We recently adopted a new software program to optimize our delivery routes and provide real-time tracking of truck location and driver performance. Each year, this technology saves our drivers 147,000 miles, cuts fuel use by 17,200 gallons, and reduces our carbon footprint by 168 tons carbon dioxide equivalent.

Lightweighting

Smithfield encourages our third-party haulers to use new, lighter equipment when delivering Smithfield products. These trucks are more fuel-efficient and can carry more product, saving money and reducing the number of trips.

We also implement lightweighting practices at our own operations. For example, our farming operation in Milford, Utah, replaced the dual tires on its tractor-trailers with single, lighter, wider tires. Because it weighs less now, each truck can carry more feed, which reduces the number of trips. This saves \$106,250 in fuel costs for the Utah operation per year and lowers carbon dioxide emissions by 100 metric tons annually.

Consumer Use

The consumer use stage of the value chain (including refrigeration, cooking, cleanup, and waste disposal) accounts for a sizeable piece of our GHG footprint: 20-25 percent. Because we have very little control over how consumers use our products, we are not focusing our GHG reduction efforts there. However, the trend in the marketplace toward shelf-stable, pre-cooked foods with smaller portion sizes tends to reduce consumer energy use while increasing it at our facilities, where we actively manage for energy efficiency improvement. Smaller portion sizes also minimize food waste.

Performance Summary

This section provides performance highlights toward all of our environmental targets and commitments.

We report some metrics in absolute terms; others are normalized by 100 pounds of product (cwt). The 2014 and 2015 normalized figures for greenhouse gas (GHG) emissions, energy, water, and solid waste have been restated as a result of improved tracking of production volumes at our facilities. Recent changes we made to our GHG emissions calculations also impacted GHG and energy metrics for prior years.

At the time of publication of this report, we were still developing the 2010 baseline performance totals for our GHG emissions. We expect to begin reporting progress against our new emissions target in our 2017 Sustainability Report.

GHG Intensity

(metric tons CO₂e/cwt)
14–16 Change: -5.7%



CO₂e stands for carbon dioxide equivalent. CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Direct and Indirect GHG Emissions	2014	2015	2016	14-16 Change
Carbon dioxide (CO ₂) emissions (metric tons)	1,057,299	1,089,596	1,120,687	6.0%
Methane (CH ₄) emissions (metric tons CO ₂ e)	2,290	2,330	2,397	4.7%
Nitrous oxide (N ₂ O) emissions (metric tons CO ₂ e)	3,207	3,233	3,200	-0.2%
GHG Emissions (metric tons CO₂e)	1,062,796	1,095,159	1,126,284	6.0%

CO₂e stands for carbon dioxide equivalent. Smithfield reports GHG emissions using The Greenhouse Gas Protocol Initiative developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Publicly available emissions figures are used where no reliable data are available from energy providers. We report on scope 1 emissions (direct) and scope 2 emissions, which include indirect emissions associated with the use of purchased electricity and steam. Data do not include hog production operations.

Energy Intensity

(gigajoules/cwt)
 14-16 Change: -14.5%



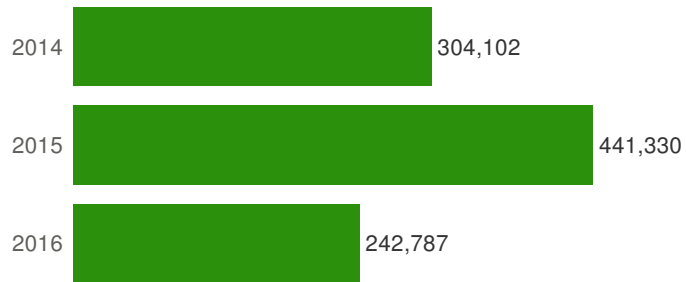
CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Direct and Indirect Energy Use by Fuel Type (gigajoules in millions)	2014	2015	2016	14-16 Change
Natural gas	8.27	8.85	6.99	
Propane	1.40	1.31	1.55	
No. 2 oil (includes transportation diesel)	0.74	0.75	0.90	
No. 6 oil	0.13	0.00	0.00007	
Biogas	0.30	0.44	0.24	
Total Direct Energy Use	10.84	11.35	9.68	-10.7%
Electricity	5.78	5.96	6.06	
Total Indirect Energy Use	5.78	5.96	6.06	4.8%
Total Energy Use	16.62	17.31	15.74	-5.3%

Biogas Captured

(gigajoules)

14-16 Change: -20.2%



We restated 2014 and 2015 figures after discovering a faulty meter at a processing facility. Annual volumes naturally fluctuate within our facilities' anaerobic systems.

Water Intensity

(gallons/cwt)

14-16 Change: -3.3%



CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Water Use

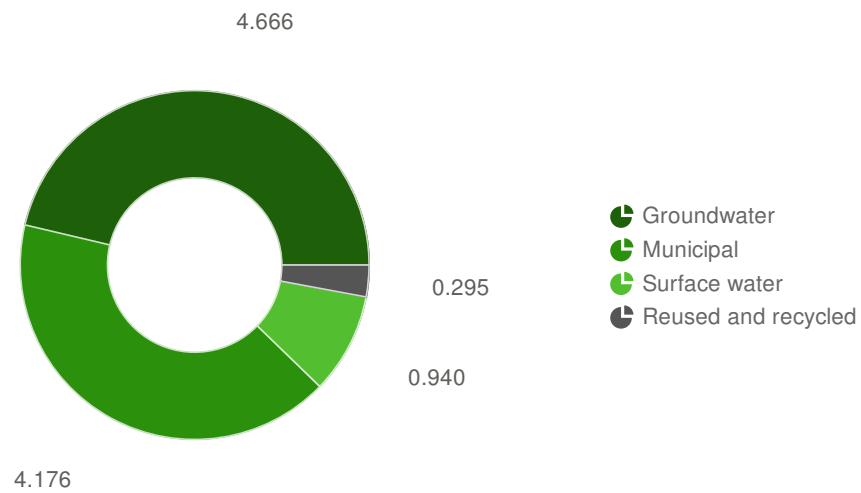
(billions of gallons)
 14–16 Change: 6.2%



As a result of improved reporting practices, we have restated 2014 and 2015 figures.

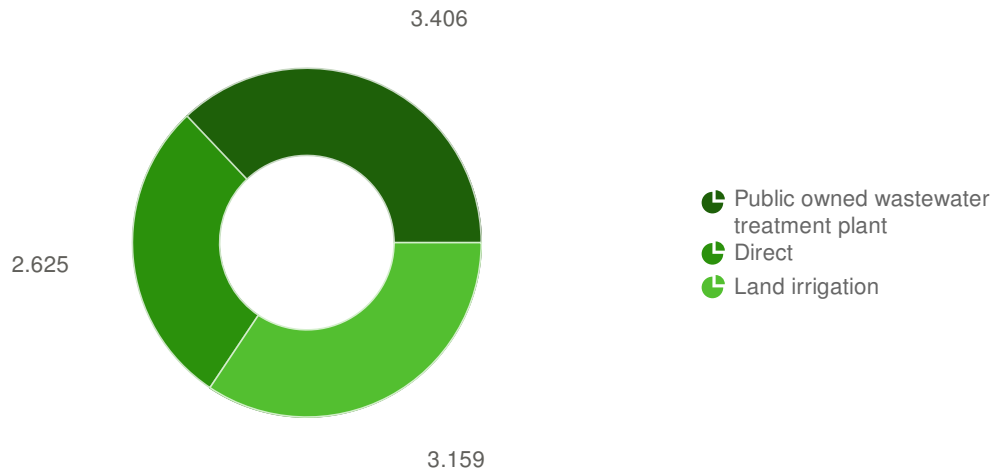
Sources

(billions of gallons)



Discharge

(billions of gallons)



Normalized Material to Landfill

(pounds/cwt)
14-16 Change: -2.3%



Data do not include manure. At our hog production operations, solid waste is typically hauled away for a fixed fee; as a result, reliable weights are not available. CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Total Waste Disposition (Tons)	2015	2016
Cardboard recycled	26,724	27,288
Metals recycled	2,153	3,973
Plastics recycled	1,259	2,395
Wastewater sludge land applied	52,775	47,573
Material composted	20,512	20,819
Material anaerobically digested	29,285	9,851
Waste to energy	25,916	39,261
Hazardous waste	9.3	9.4
Universal waste	62.4	28.7
Material to landfill	70,946	71,373
TOTAL	229,642	222,571

Data do not include manure. At our hog production operations, solid waste is typically hauled away for a fixed fee; as a result, reliable weights are not available. CWT equals 100 pounds of product.

Compliance	2014	2015	2016
Notices of violation (NOVs)	18	11	18
Fines (\$U.S.)	\$400	\$400	\$6,500

Data include all domestic farms and plants.

Environmental Performance of Contract Producers

Contract growers own their facilities and permits and are responsible for compliance with rules and regulations. We regularly consult with them on compliance issues like nutrient management, environmental permitting, and new technology. We also monitor their environmental performance and offer assistance when, and if, requested.

Contract Farm Compliance	2014	2015	2016
Notices of violation (NOVs)	14	34	41

Data are based on reviews of state databases and production staff surveys.

Our Management Approach

Effective environmental management is critical to the success of our business and to the achievement of our long-term sustainability goals. Our Environmental Policy serves as the foundation for all of our efforts, with our environmental management systems (EMS) as our operating system. We work to minimize our impact on natural resources up and down our supply chain.

Environmental Policy

Smithfield¹ is committed to conducting business in a manner consistent with continual improvement to protect the environment:

- We are committed to protecting the environment through pollution prevention and continual improvement of our environmental practices.
- We seek to demonstrate our responsible corporate citizenship by complying with relevant environmental legislation and regulations, as well as with other requirements to which we voluntarily subscribe. We will create, implement, and periodically review appropriate environmental objectives and targets.
- Protection of the environment is the responsibility of all employees within the scope of the EMS.

Smithfield communicates this policy to persons within the scope of the EMS and makes it available to the public upon request.

¹ All references to "Smithfield," "we," "us," and "our" are terms of convenience used to refer collectively to Smithfield Foods and all of its subsidiaries. Similarly, the terms "division," "segment," and "business unit" may be used to refer to one or more subsidiaries, which are independent operating companies.

Recognition & Awards

As part of our sustainability program, each facility is expected to submit at least one sustainability project to our internal awards program, which recognizes environmental stewardship efforts coupled with economic benefits.

Winning programs are selected based on several factors, including environmental impact, social significance, efficiency, cost-effectiveness, originality, and technical value. Winning facilities receive recognition from senior management and cash awards of \$5,000, of which \$3,000 goes to a nonprofit of the award recipient's choice. We presented nine Environmental Excellence Awards for 2016.

See the [Water](#) section for information about a project in our Kinston, North Carolina, plant that earned the President's Award.

External Awards

All facilities are also expected to apply for at least one third-party environmental award (e.g., local government, environmental group, regulator, trade association, or charitable foundation). In 2016, our operations received 69 third-party awards, recognizing efforts to improve packaging, water management, and energy consumption, including these from the following organizations:

- North American Meat Institute (NAMI) Foundation Awards
- NAMI Environmental Achievement Awards
- [National Association of Conservation Districts 2016 Friend of Conservation Award](#)
- [2016 National CSR Awards Finalist](#)

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Water Policy

Water is an essential natural resource for our business and our communities. Consistent with Smithfield's commitment to environmental stewardship, we place the highest priority on the conservation and protection of this critical resource.

Throughout all aspects of our business worldwide, Smithfield will strive to reduce the impacts of our operations on water resources and to protect and sustain the water supply for our communities and our business.

Smithfield will take a leadership role in managing water supplies cooperatively with our communities. The 2010 United Nations General Assembly Resolution recognizes the right to a safe and sufficient water supply, and, wherever we operate, Smithfield will help ensure the sustainability of this essential resource.

As part of this commitment, Smithfield will implement proactive management systems that direct this effort throughout the Company, adhering to the following principles:

- 1. Quality.** As Smithfield manages and utilizes our water resources, we aim to preserve and enhance the quality of these resources for our communities and our operations. Sustaining water quality is an on-going management priority and is incorporated into our planning and day-to-day operations.
- 2. Conservation and Efficiency.** Smithfield will manage our water supply mindful that it is a finite resource and will preserve its quantity and availability to the community and our operations. Smithfield will strive to constantly improve the efficient use of its water supply. We will maintain targets for decreased consumption and cost, pursue best practices, and track progress to evaluate performance over time.
- 3. Cooperation.** We will work with our local communities and regulatory agencies to manage water resources. As a company, Smithfield is committed to complying with all regulatory mandates as we utilize water supplies. The Company will maintain transparency and open communication with the community.

Smithfield is a leader in our commitment to protect and enhance the environment. Likewise, as a company, we will be responsible stewards of water supplies and partners with our communities to ensure the sustainability of the resource.



Our Commitment To Safe, High-Quality Foods

Consumers put their trust in Smithfield every time they eat one of our products. That's why the safety and quality of our foods is fundamental to our success as a company, underscoring our mission to provide "Good food. Responsibly.®"

Food safety **starts on the farm**, where we have rigorous systems in place to raise healthy animals. It continues at the processing plants, where we follow meticulous and exacting procedures. Our vertically integrated business enables traceability from the conception of the livestock to the consumption of the final products. At Smithfield, every employee along that path plays a role in ensuring that our processes are followed.

Our Food Safety & Quality Goal

- Deliver safe, high-quality meat products

Our Food Safety & Quality Targets

- No incident requiring U.S. Department of Agriculture (USDA) recalls
- Maintain Global Food Safety Initiative (GFSI) certification at all applicable facilities

We partner with industry, government, and independent experts to create and implement leading, science-based food safety and quality practices that we constantly strive to improve. We have a zero-tolerance policy regarding food safety violations and have built a workplace culture that places responsibility for food safety squarely on the shoulders of every farm and plant employee.

In 2016, we had zero USDA recalls of any food product for the third consecutive year.

Consumers' expectations of food companies continue to evolve. They want to know more about what is in the foods they purchase—and they want simplified labels with ingredients that they can understand and pronounce. We believe it's important to be transparent about what goes into our products, so we can continue to build trust with our customers and consumers.

To demonstrate even greater transparency, and in what we believe to be a first for the meat industry, we publish an online [ingredient glossary](#) that includes more than 100 definitions of ingredients that can be found in our foods. We started in 2016 with the products that represent the greatest volume of retail sales—in other words, our most popular products. We added on several more definitions in early 2017.

Innovation—both in the foods that we make and in the way that we make them—is essential in our continued evolution from a commodities business to a consumer packaged goods company. Our heightened focus on innovation is driven by consumer preferences, transparency, nutritional concerns, and opportunities to reduce our environmental footprint.

In the following video, learn more about fresh pork production and our leading traceability program.

Value Creation

By maintaining the highest food safety standards, we build value for our own company and for the retailers and vendors that sell our products in supermarkets and restaurants.

Product quality and safety is one of the biggest areas of risk for food producers and manufacturers. Products are susceptible to contamination by disease-producing organisms or pathogens, which are found naturally in the environment. Product contamination can subject food companies to product liability claims, adverse publicity, government intervention, and decreased sales as customers lose confidence in the safety and quality of the food. But most important, product contamination threatens to affect the health and well-being of our consumers and their families, which remain paramount to everything we do at Smithfield.

Given the potential negative impacts from food safety failures, our company has numerous systems in place that are designed to monitor and mitigate food safety risks. Read more about our [food safety laboratories](#).

Smithfield invests millions of dollars each year in capital improvements to facilities and equipment, focusing on the safety of our products and protection of our employees while simultaneously enhancing production at existing and new facilities. During 2016, our company spent about \$20 million on capital projects that continue to advance our industry-leading food safety and quality standards, such as upgrading refrigeration systems, maintaining physical integrity of our facilities, upgrading cleaning and sanitation systems, and installing new product and environmental testing equipment.

We also emphasize [product innovation](#), which we see as one of the keys to unlocking value and driving growth for Smithfield and for our retail and food service partners.

Our Processing Plants

Detailed procedures. Complex protocols. Sound science. These are the hallmarks of an effective food safety program. But beneath all of that, food safety is really about the people who live and breathe it every day on the production lines.

Warren Dorsa, one of Smithfield's vice presidents of food safety and quality, describes our food safety system as a daily exercise of blocking and tackling. "You can have the best technology at a plant, but if your employees fail to do the basics, you're not going to succeed," he says.

At Smithfield, our plant employees keep constant sight of our annual target of zero U.S. Department of Agriculture recalls. "We work diligently to create non-events in food safety," Dorsa continues. "Our role is to keep Smithfield out of the headlines when it comes to the safety of our products."

We have instilled in our people a culture that puts food safety as their highest priority. This concept comes from the very top of the company—from leaders who insist that food safety is non-negotiable. For example, plant workers have the authority to shut down production if, for any reason, someone believes that the safety or quality of the food might be compromised. We tell all production employees that food safety is up to them, and they take that responsibility seriously.

No matter how professionally it is done, food production always entails some food safety risk. Our job is to manage those inherent risks, using science as our guide.

"Our rule of thumb is this: If they see something that would make them not want to eat the product or feed it to their families, then we're not going to feed it to anybody else. So we tell them to shut the lines down," says Katie Hanigan, one of Smithfield's vice presidents of food safety and quality.

No matter how professionally it is done, food production always entails some food safety risk. Our job is to manage those inherent risks, using science as our guide. From good personal hygiene to good manufacturing practices, there are, quite literally, thousands of procedures we must follow every day to be sure that the meats we produce are safe. Wherever possible, we automate the process to minimize the possibility of bacterial contamination.

For example, we have cutting-edge robotics technology on the slaughter floor in several of our facilities. This technology provides the latest in hygiene and safety requirements while improving accuracy and increasing product yields during the cutting and deboning process. We have installed the technology in three facilities and plan to add it in other locations in the coming years.

But automation can only improve conditions to a point. We also must rely on our people to manually clean equipment and inspect machinery during and after each production shift. Every night, our most critical manufacturing equipment gets disassembled, scrubbed clean, sanitized, and put back together for the next day's production run.

Food Safety Certification

The **Global Food Safety Initiative** (GFSI) certifies a plant's compliance with an internationally recognized set of food safety standards, making food safety and quality assessments more consistent and efficient while ensuring compliance in foreign markets. Many of our customers rely on the GFSI certifications, knowing that they represent the gold standard in the industry.

One hundred percent of applicable Smithfield facilities—33 in total—are GFSI certified and subject to GFSI's annual third-party audits. We have an annual target of maintaining that certification at all facilities.

Training

Our Food Safety and Quality Training Policy outlines required food safety and quality training topics, trainer qualifications, and the frequency of training at all of our subsidiary processing facilities. Each plant employee is trained upon hiring and is retrained on an ongoing basis, depending on his or her job requirements. Facilities spend thousands of man-hours training employees in food safety procedures and hold daily pre-shift meetings that often include food safety or worker safety topics.

Our training programs also take into account the diversity of our employee base. At many plants, workers are non-native English speakers, so training manuals and hands-on sessions are offered in multiple languages.

A number of employees have gone through advanced training sessions—known as Brown Belt and Black Belt training—that are unique in our industry and cover a range of food safety and food science topics.

Auditing, Inspections, & Testing

Our facilities are subject to multiple types of safety and quality audits and inspections, including internal, government, and third-party. In addition, we regularly conduct mock product recalls in which facility staff must locate 99.9 percent of affected food products within two hours.

Any nonconformance discovered by an audit is addressed swiftly at each facility. We conduct a follow-up audit after the initial audit to make certain that any corrective actions have been accomplished and then share our findings with other Smithfield facilities.

Case Study: Inside a Smithfield Food Laboratory

Most people try to avoid spoiled meat. The microbiologists at Smithfield Foods surround themselves with it.

The scientists at our in-house food safety research laboratories test, validate, and evaluate the latest in food safety technologies. At our lab in Cincinnati, for example, team members intentionally inject Smithfield products with microorganisms—such as *Salmonella*, *Listeria*, and *E. coli*—to see how the pathogens will react over time to cooking, chilling, or refrigerated storage.

Among their responsibilities is oversight of the expiration dates stamped on our packaged meats products. Many categories of foods, such as cereals, crackers, or canned goods, are considered “best” if consumed by a certain date. Meat, on the other hand, will eventually spoil, so the shelf life dates are based on scientific risk assessments of *Listeria* growth, as well as quality parameters.

Our Dennison, Iowa, microbiology facility was recently named an accredited laboratory by the American Association for Laboratory Accreditation (A2LA), a nonprofit membership society. We are one of only 283 organizations nationwide currently accredited.

These scientists work on what we think of as the “ugly side” of product innovation. They grow bad bugs and put them in samples of products in a controlled environment to better understand countermeasures we can implement to combat pathogens and other food safety risks.

For example, the scientists will inject *Listeria* into bologna and put it in a lab refrigerator for several months, testing it every few weeks to see how much the bacteria grow over time. The results help Smithfield determine which preservatives and antimicrobials will offer the best—and the longest—protection for particular products.

Salt is a key preservative in packaged meats such as ham and bacon. Microbiologists like salt because the bacteria hate it. But more and more, consumers are asking for products with reduced sodium, creating a balancing act to determine how low in sodium a product can go while still controlling potentially harmful pathogens.

Over the last year, our laboratories have been especially focused on helping Smithfield transition to “cleaner labels,” in response to consumer requests for products made with more understandable ingredients. ([Read more on clean labels.](#))

We already know a significant amount about how preservatives such as lactate, nitrite, and benzoate work in our foods, but there isn’t much published science about the natural ingredients, such as vinegar-based antimicrobials, that are replacing them. “It’s an important area to research,” says Kaitlyn Compart, manager of science for corporate food safety and quality at our Cincinnati lab. “We want to meet consumer demand for cleaner labels but we also need to ensure we create safe products.”

Although most of our research is proprietary, our team has published a host of scientific papers in peer-reviewed journals on behalf of Smithfield Foods. In some instances, we share our results because we feel it helps improve food safety across the industry as a whole, and it further demonstrates that we’re making safe products. For example, one paper written by our team gave peer companies some important insights into the temperatures that are safest for cooling smoked bacon during production.

Above all, these labs infuse science into the decisions that we make about our products so that our food safety decisions are solidly based on science, facts, and empirical data, rather than conventional wisdom or market trends. Says Compart: “Our scientific approach and insight allows us to truly say we are producing ‘Good food. Responsibly.’[®]”

Innovation

At Smithfield, we emphasize the importance of innovation—both in our products and in the way that we make them. Our chief innovation officer and vice president of innovation are driving a culture of innovation across the company.

“Employees at our company automatically think innovation comes from our product Innovation Center in our Virginia headquarters,” says Will Brunt, who took on the chief innovation officer role in 2015. “But we’re trying to get everyone to think more innovatively, no matter what their roles or responsibilities.”

Brunt notes that process innovation can have a faster impact on the company than product innovation. A new product can take two years to develop and launch—and the financial rewards won’t be seen for a year or two after that. But changing the way a product is made can have a much more immediate impact on the company’s bottom line or its ability to improve safety or save resources. Innovation has been central to Smithfield’s sustainability program for many years.

Where product innovation is concerned, we’ve been getting more strategic and have developed a pipeline of new products to roll out over the coming years. We have been paying closer attention to consumer preferences and market research to stay ahead of the curve with new products that capitalize on emerging trends. We have also begun labeling products to showcase which ones are gluten-free or good sources of protein in response to growing marketplace trends.

One innovation that we recently launched is a breakfast sandwich with dough that holds up in the microwave—without turning soggy. We developed the biscuit sandwiches for consumers looking for high-protein breakfasts that are easy to prepare and can be eaten on the go.



Case Study: Making Marinated Fresh Pork Even Better

Time-strapped consumers are constantly looking for foods that are flavorful and fast to prepare. Our marinated fresh pork line has been a top seller—and growing in volume—because it offers a high-protein meal that is both convenient and delicious.

But we saw an opportunity to take these popular products and make them even better by lowering sodium and reducing the number of ingredients in the marinades. In particular, we swapped out several of the sodium-based antimicrobial ingredients and replaced them with versions based on potassium, which preserve the meat without compromising safety or taste. We also were able to remove pork broth, which contained additional sodium and maltodextrin, an additive that acted as a binder.



“We reduced sodium from 480 milligrams to 360 milligrams per four-ounce serving, or by 20 percent, which is a meaningful amount when considering that consumer taste tests showed no difference between the old and the new recipes,” says Joshua Shook, who oversaw the project as Smithfield’s research and development manager for fresh pork. “Sodium plays such a critical role in food safety. Any time you can remove some sodium while maintaining the same level of safety is very significant.”

We also adapted the sodium reduction techniques to our Smithfield Extra Tender Fresh Pork line, which is not pre-seasoned but uses an enhancement solution to improve tenderness and quality. We lowered sodium in this family of products by about 20 percent as well.

Despite the impressive sodium reductions, we didn’t tout them on product packaging.

“When you put ‘reduced sodium’ on the label, many consumers automatically think it won’t taste as good and have a negative perception,” Shook says. “So we elected not to promote the sodium savings on the label.”

We’re considering this “phase one” of an ongoing reformulation project at a time when consumers are asking for labels that are easier to understand. Our next step is to find replacements for the potassium acetate and potassium lactate, which currently act as the primary preservatives and stabilizers in the products. But Shook says the second phase will be much more challenging than the first.

“We would love to eliminate the potassium ingredients and get to a very clean label, but they are necessary for food safety,” Shook says. “Suitable

replacements may not even exist, so we are now on the front end trying to work with other companies to discover new technologies that no one is even thinking of yet.”

For Smithfield, the changes had an added value creation benefit for our own company: We were able to provide all the product benefits without increasing production prices and, in some cases, we even reduced ingredient costs.

New Antibiotic-Free Product Line

In early 2017, we announced the launch of our new antibiotic-free line of fresh pork products under our Pure Farms™ brand. The hogs raised for these products are never given antibiotics. The product line, which includes fresh pork and ham cuts, breakfast sausage, and bacon, are minimally processed with no steroids, hormones, or artificial ingredients.

As the only company in the industry to report antibiotics usage since 2007, this new product line further affirms Smithfield’s continued leadership of practices that uphold the highest standards of transparency and strengthen consumer trust. Read more about antibiotics in the [Animal Care section](#).

Nutrition

Our research and development teams of chefs, food scientists, and nutritionists look for ways to respond to the evolving tastes and needs of consumers.

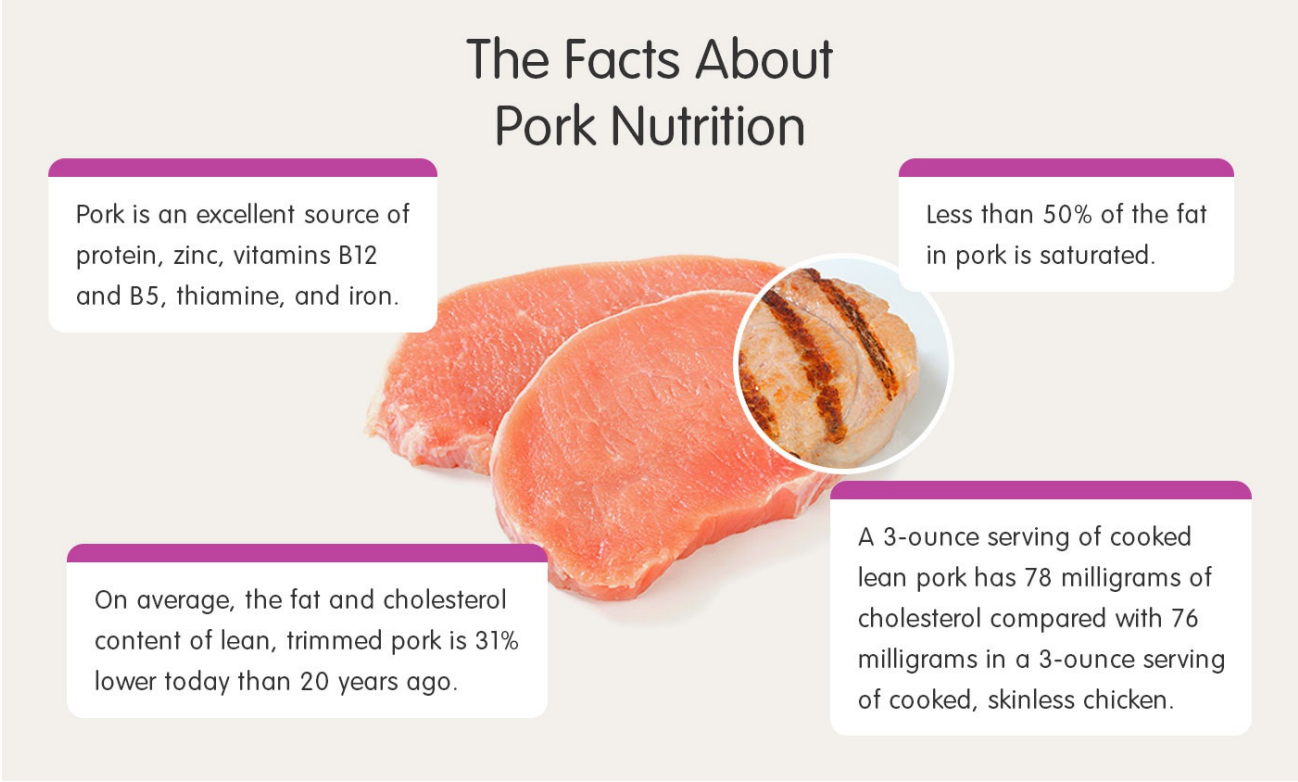
In prior years, we tended to be more reactive on product development, coming up with new flavors and varieties when we were asked to do so by large grocery chains and foodservice providers. Today, however, it's a very different story, and we are working proactively across our product lines to make improvements, including nutritional enhancements.

We have worked hard in recent years to provide options that reduce fat, sodium, and sugar wherever possible and still provide a product with the great taste that consumers expect from us. In all product categories, we have lower-salt lines, and we are constantly innovating to develop new techniques to improve the nutrition profiles of our foods.

We have many examples we can point to, including dozens of products across three brands—Healthy Ones, Krakus, and Kretschmar—that meet the American Heart Association's certification criteria for foods that are low in saturated fat and sodium content. In addition, we have more than 300 products that offer health and wellness benefits, such as lower sodium, reduced fat, no added sugar, gluten-free, no artificial ingredients, and no nitrites or nitrates. These span across our deli, retail, and foodservice channels.

In recent years, we have focused in particular on breakfast meats that provide health and wellness attributes, from fully cooked pork sausage patties made with all-natural ingredients, no preservatives, and no monosodium glutamate (MSG) to bacon with 50 percent less sodium than traditional bacon and no added sugar.

The Facts About Pork Nutrition



Pork is an excellent source of protein, zinc, vitamins B12 and B5, thiamine, and iron.

Less than 50% of the fat in pork is saturated.

On average, the fat and cholesterol content of lean, trimmed pork is 31% lower today than 20 years ago.

A 3-ounce serving of cooked lean pork has 78 milligrams of cholesterol compared with 76 milligrams in a 3-ounce serving of cooked, skinless chicken.

Sodium

We continue to evaluate the sodium levels in all of our products so we can offer the right choices to accommodate a large number of different diets

and lifestyles. At the end of 2016, we offered more than 100 reduced-sodium products in the marketplace.

Sodium is a life-essential nutrient and is important for food preservation and food safety. Curing meats with salt, for example, blocks the growth of bacteria and prevents spoilage. Salt is also a key ingredient in many of our products and helps us meet customer and consumer demands for quality, authenticity, flavor, and convenience.



Our Smithfield Lower Sodium Bacon has the lowest sodium content among the top three competitors—160 milligrams per 17 grams (or two fried slices). That's 25 percent lower than the next lowest competitor and 43 percent lower than the third.

We recognize that there are concerns about too much sodium, which can lead to high blood pressure in some individuals. Most U.S. estimates show Americans eat more sodium than they should each day.

Our [sodium policy](#), which is based on our commitment to producing wholesome food products for our customers, is consistent with the view that a healthy lifestyle is based on a range of factors, including dietary patterns and exercise. Our policy calls for the following:

- A broad spectrum of products to meet different needs and tastes to ensure that consumers can make choices that suit their individual lifestyles;
- Sodium-reduced products for the benefit of consumers who opt for these choices or who are on restricted diets;
- Strict adherence to all health and disclosure regulations issued by the U.S. Food and Drug Administration and the U.S. Department of Agriculture; and
- Continuous analysis and improvement of our product portfolio.

All our brands offer a variety of products that are lower in sodium than their traditional counterparts.

Case Study: Cleaning Up Labels

What started as a trend several years ago has become increasingly more mainstream: a desire among consumers to buy foods made with simpler, shorter, and easier-to-understand lists of ingredients.

People are paying closer attention than ever to what goes into their foods. And they want to eat those made with ingredients that they can recognize and pronounce. At Smithfield, we have been looking to answer that call, identifying ways to clean up our label statements while still maintaining product safety and quality.

Where possible, we have been exploring the replacement of certain antimicrobial preservatives, such as sodium lactate and sodium diacetate, with vinegar or lemon juice concentrate. Antimicrobials are important because they prevent dangerous bacteria from growing. But vinegar and lemon juice can have similar positive impacts on product shelf life. (See the [case study on our laboratories](#) to learn more.)

We have also been analyzing manufacturing techniques such as high-pressure pasteurization during food processing, which can reduce the need for some typically used preservatives.



Smithfield's All Natural® Pork Sausage, made with sea salt, has no artificial ingredients and no preservatives.

Finding “cleaner” alternatives is a challenge for all food companies, particularly when it comes to maintaining food safety. We also need to ensure that any replacement ingredients don't have an unwanted impact on flavor, texture, or color.

Adding to the complexity is quite a bit of confusion about some products that are labeled as “natural” products. For example, sodium bicarbonate is baking soda; it's a naturally occurring product, but it has a complex name that may confuse some consumers. And celery juice can be used as an alternative to nitrates and nitrites in cured meat, but celery itself contains a significant amount of nitrates that are naturally occurring. To avoid that confusion, we do not label any product as “natural” unless it satisfies the U.S. Department of Agriculture's (USDA's) definition of minimally processed with no artificial ingredients and until the USDA has approved our “natural” labeling claim.

We are also mindful that some of our customers—such as large restaurant chains—have been publishing so-called “no-no lists” of ingredients that they will not allow in their supply chains. We work with our customers to make products that will fit their specific needs.

Sodium Policy

Salt (sodium) is a life-essential nutrient and a critical component for food preservation and food safety. At Smithfield ¹, salt is also a key ingredient in many of our products and helps us meet customer and consumer demands for quality, authenticity, flavor, and convenience.

Smithfield's policy is based on our commitment to producing wholesome food products for our customers and calls for the following:

- Provide a broad spectrum of products to meet different needs and tastes, and which ensure that consumers can make choices that suit their individual lifestyles.
- Offer sodium-reduced products for the benefit of consumers who opt for these choices or who are on restricted diets.
- Strict adherence to all health and disclosure regulations issued by the FDA and USDA.
- Continuous analysis and improvements to our product portfolio.

Our policy is consistent with the view that a healthy lifestyle is based on a range of factors, including dietary patterns and exercise, and not on just one nutrient.

¹ All references to "Smithfield," "we," "us," and "our" are terms of convenience used to refer collectively to Smithfield Foods and all of its subsidiaries. Similarly, the terms "division," "segment," and "business unit" may be used to refer to one or more subsidiaries, which are independent operating companies.



Our Commitment to Helping Communities

Smithfield greatly values our connection to the communities where our people work and live. We strive to maintain a relationship of mutual support, and we take seriously our responsibility to keep our communities strong.

Our Community Goal

- Support our communities

Our Community Targets

- Each facility/farm division to participate in four community events per year for charities/nonprofits
- At least one event per year must include a stakeholder presentation
- Each U.S. division to sponsor at least two Learners to Leaders® programs each year
- Maintain our Helping Hungry Homes® program donations of product to those in need

As one of the nation's leading food producers, we are especially well-positioned to contribute to hunger relief as part of our philanthropic and community outreach efforts. We have focused on tackling food insecurity in America through more than just food donations; we are also committed to raising public awareness through a diverse set of partnerships, as well as through employee-led community activities.

Education and support for veterans and military families are two other key elements of our giving strategy. We also focus on charitable causes that align with the five pillars of our sustainability program: Animal Care, Environment, Food Safety and Quality, Helping Communities, and People.

Our Social Purpose

Smithfield Foods is committed to improving food insecurity and ending hunger by donating high-quality, nutritious food. We created our Helping Hungry Homes® initiative to alleviate hunger across the country. We also support other philanthropic solutions in the fight against hunger as well as in the areas of education, veterans, and those that align with our sustainability program.

In 2016, we distributed nearly \$400,000 through our signature educational scholarship program, reaching a total of 95 students. We support veterans-focused nonprofit organizations and, through our new **Operation 4000!** initiative, we are taking our commitment to the military to a new level with a plan to hire more veterans and increase our support for veteran employees.

In June 2016, we centralized all charitable giving activities at the corporate level as part of our wider "One Smithfield" initiative to create a unified company. The new process allows us to more strategically and effectively coordinate across all of our operations so that we can amplify our impact. This holistic approach will better enable us to fulfill our **mission, vision, and social purpose**.

In addition, as an employer of more than 52,000 people, we also play an important role on issues such as environmental stewardship, disaster relief, and health and wellness in our local communities. We continue to develop specific programs that address the unique needs of communities at each of our locations, including donations to schools, beautification efforts, and local fundraisers.

Value Creation

The strength of our business depends in large part on the strength of the communities where we work. Stable and prosperous communities not only support our ability to recruit and retain excellent workers—a crucial ingredient to our success—but also provide a good place for our employees to live.

Moreover, the economic vitality of our local communities—and agricultural communities more broadly—provides the basis for a reliable supply of the goods and services we need to operate.

Smithfield creates value in the communities where we work in a number of ways. We provide jobs, pay taxes, and, in many locations, underpin the economic health of the regions where our operations are located. We also create societal value through our initiatives related to hunger relief, support for military families, education, and health and wellness.

In addition, our cause marketing efforts, in partnership with retailers, generate funds for charities and raise awareness of issues such as food insecurity and challenges facing many military families.

By the Numbers	2016
Cash donations	\$7.7 million
Food donations (cash value)	\$14.5 million
Food donations (servings)	17.6 million
Total amount of donations	\$22.2 million

Food donations were valued at an average retail price of \$3.30 per pound. There are four servings to a pound.

Shopping for a Cause

We are always seeking ways to generate the most positive impact, whether through our business or through charitable activities. In order to maximize our giving, we work regularly with a range of both nonprofit and retail partners to create unique donation opportunities, often linked to Smithfield product sales, to people in need around the country. These collaborations add value to the charities and retail partners involved, while also adding value to Smithfield brands. And consumers buying Smithfield products can feel good knowing that their purchases lead to a donation to nonprofits doing great work. We like to think of it as “doing well, while doing good.”

Partnering with retailers provides an opportunity to expand our giving capabilities. In 2016, we continued to make several kinds of donations, including hundreds of thousands of dollars in free groceries, several new cars, and a new house. We also held approximately 140 cause marketing events around the country, up from 100 events the previous year.

“Our six-year partnership with Smithfield Foods is a testament to their steadfast commitment to helping us provide life-changing programs to this very special and deserving group of our fellow citizens who do so much to protect the freedoms we, as Americans, enjoy daily.”

—Brig. Gen. (ret.) John I. Pray, Jr.
President and CEO, Operation Homefront

We work with charities whose goals are aligned with Smithfield and that resonate with consumers. Often, we partner with celebrities and musicians who are able to draw further attention to a cause, generate excitement at events, and boost product sales (which, in turn, results in bigger donations for the charity). Celebrity Chef Ingrid Hoffmann, football star Reggie Wayne, and racing icons Richard Petty and Aric Almirola are just some of the public figures who helped spread the messages of our nonprofit partners at Smithfield events throughout 2016.

Some of our most successful brand campaigns include the following:

- **Our Eckrich® Brand and Operation Homefront.** The Eckrich brand has donated more than \$2.5 million to Operation Homefront, a nonprofit focused on building strong and stable military families, since 2012. In addition to direct financial support, we work with retail partners to provide free groceries and other in-kind contributions to military families in need. In 2016, Smithfield contributed over \$595,000 worth of free groceries and donated two new trucks to Operation Homefront families via nearly 60 retail partner events around the country. Learn more about our work with [Operation Homefront](#).
- **Our Farmland® Brand and No Kid Hungry.** In 2016, Farmland partnered with No Kid Hungry (NKH) to create the Farmland Fights Hunger campaign. For every Farmland product sold during the holiday season, we made a \$.25 donation to NKH, raising a total of \$100,000 for the organization. With this donation, NKH can connect 1 million meals to children facing hunger in America. Former Kansas City Royals first baseman Mike Sweeney and reality TV star Chris Soules joined Farmland to help promote this campaign.
- **Our Kretschmar® Brand and Make-A-Wish.** Since 2012, we have donated more than \$600,000 to the national arm of the Make-A-Wish Foundation, which grants wishes of children with a terminal illness, and sponsored more than 12 wishes through local chapters of the foundation. Through on-package promotions on our Kretschmar products and partnerships with retailers, in 2016, we raised more than \$150,000 for the nonprofit, including a \$15,000 donation for the foundation’s Minnesota branch. We also helped grant the wishes of four terminally ill children, providing trips to the San Francisco Zoo, CMA Music Festival® and Walt Disney World®, as well as the restoration of a classic pickup truck.
- **Carando® Cares.** Our Carando brand has been working to support organizations making a positive impact in local communities through the Carando Cares initiative since 2013. In 2016, Carando hosted several events, including a holiday meal for the airmen at Barnes Air National Guard Base in Westfield, Massachusetts, and made donations to Sylvester Comprehensive Cancer Center in Miami, the Boys and Girls Club in Plymouth, Massachusetts, Frontline Foundations in Indiana, the Food Bank of Western Massachusetts and the Food Bank of Western New York.
- **Our Healthy Ones® Brand and the Breast Cancer Research Foundation (BCRF).** In 2016, Healthy Ones continued its partnership with the BCRF for the sixth consecutive year and has donated over \$250,000 to the organization to date. Healthy Ones also ran customer marketing events that raised an additional \$50,000 for the organization this year.

Smithfield Racing Events

Our brands frequently tie our donations to Smithfield’s sponsorship of Richard Petty Motorsports, arranging large donations to food banks and hosting events that help raise awareness around the challenge of food insecurity in America. For example, in May, we partnered with racing legend Richard Petty and Price Chopper to help kick off the 24th annual “Stamp Out Hunger” food drive for Harvesters—the Community Food Network, a regional food bank serving 26 counties across Missouri and Kansas. Smithfield also donated 25,000 pounds of protein to Harvesters as part of the event.

In addition, this year, Smithfield teamed up with NASCAR driver Aric Almirola to arrange inspirational school-speaking appearances directed at Hispanic youth. Almirola, who is Cuban-American, spoke at two local middle schools—in Bloomington, California, and Aurora, Illinois—about the importance of hard work and perseverance.

Charitable Giving & Volunteerism

Financial and in-person support of critical community organizations and programs is a key part of our company's mission to be the most-trusted food company.

We help create strong communities, in part, through charitable giving and employee volunteer efforts. In 2016, we continued our companywide employee-matching charitable giving program, which provides a 1:1 company match for any employee donation to a recognized 501(c)(3) charity of at least \$100, up to \$5,000 per employee per year. For employees that serve on the board of a charity organization, Smithfield will match double the amount of any donation to that organization.

In addition to financial support, each year our employees dedicate their time to projects in their communities. In 2016, employees volunteered more than 10,600 collective hours of volunteer time to important causes, including hunger relief, disaster preparedness, bullying prevention, toy collection for children in need, and much more.

Hunger Relief

Hunger and food insecurity unfortunately remain serious and often overlooked problems in the United States.

While there have been signs of improvement in recent years, food insecurity rates remain well above pre-recession levels, as rising income inequality, long-term unemployment, and other ripple effects from the economic downturn continue to affect millions of Americans every day.

2016 Donation Total

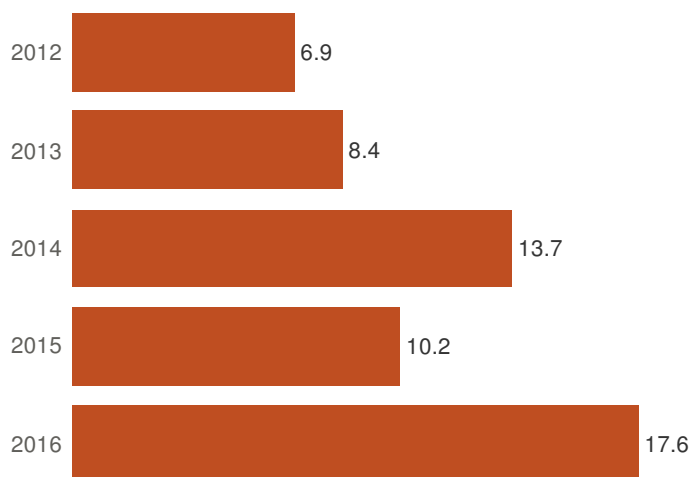
- Donated 17.6 million servings of protein to food banks nationwide

The national hunger relief nonprofit Feeding America® estimates that in 2015, 42.2 million Americans lived in food-insecure households, down from 48.1 million the previous year. Despite the decline, this means that one in every eight households does not know where the next meal will come from or is forced to choose between food and other essentials such as housing, utilities, and healthcare.

As a leader in the food industry, we believe we have a responsibility to help families in need, and we are well-placed to make a unique impact. At Smithfield Foods, hunger relief is the cornerstone of our social purpose. Through our support for food banks, disaster relief efforts, and partnerships, we help to raise both funding for, and public awareness of, food insecurity across the country.

Total Food Donations

(servings in millions)



There are four servings in a pound. After publication of our 2015 report, we restated the amount of food donations for the year to correct a miscalculation. We have centralized our tracking to more accurately reflect food donations for the entire company. In 2014, we began reporting donations by calendar year; previous years remain reported by fiscal year.

Addressing Hunger Across the Nation

Helping Hungry Homes® is Smithfield's corporate initiative to help address the ongoing problem of food insecurity in the United States. We focus on providing donations of fresh and packaged meats, which help to fill the shortfall of nutritious, protein-rich food sources that many hunger relief organizations often face. Smithfield's retail partners in the Helping Hungry Homes initiative have also made generous donations to local and regional food banks in tandem with Smithfield to support this important effort.

Since 2011 through Helping Hungry Homes, Smithfield has donated more than 65 million servings of protein to food banks and other organizations that provide food for people in need. For example, during the summer months, many food-insecure households struggle to meet the daily nutritional needs for children who would otherwise have one or two meals at school. Between June and August of 2016, Smithfield donated more than 630,000 pounds of protein to 15 food banks across the country—donations that assisted summer nutrition programs for students.

Over the last year, we have made dozens of donations to food banks and hunger relief organizations across the country—from Washington to Florida to Maine—as part of the Helping Hungry Homes® initiative. To find out more about our donation activities, visit the Helping Hungry Homes section of this site.

In November of 2016, we marked our 300th food donation by committing to distribute an additional 1 million servings of protein for the holiday season to more than 25 food banks across the country.

In addition to Smithfield donations, our employees volunteer their time to support the Helping Hungry Homes initiative. In response to the destruction caused by Hurricane Matthew in North Carolina in October, employees at one of our plants there organized a food drive that raised 10,000 pounds of non-perishable goods for donation at a local food bank. To complement that donation, Helping Hungry Homes also contributed more than 75,000 pounds in Smithfield pork products and \$10,000 to assist with on-site meal preparation and ongoing relief efforts for the hurricane victims. (See more in the [Disaster Assistance](#) section.)

We recently centralized the administration of Helping Hungry Homes at the corporate level to expand our donation capabilities. This past year, our Hog Production operations in North Carolina joined the Helping Hungry Homes effort with its first-ever event in September. In 2017, we plan to expand Helping Hungry Homes to include more employee participation and reach over 50 food banks across the country.

Addressing Hunger in Our Communities

Beyond our signature Helping Hungry Homes® program, many of our locations work at the local level to provide food in their communities.

For example, our Smithfield corporate office participates in a canned food drive, an annual event started by a group of employees several years ago. In 2016, we collected over 18,000 pounds of non-perishable goods for the Food Bank of Southeastern Virginia and Eastern Shore, which serves Hampton Roads and the surrounding communities.

As part of Feeding America's Hunger Action Month campaign, Smithfield NEXT—our millennial-focused employee resource group—organized a series of volunteer opportunities at local food banks across the country in September and October. Approximately 60 Smithfield employees of all ages volunteered at a total of five food banks near our offices in Smithfield, Virginia; Lisle, Illinois; Cincinnati, Ohio; and Kansas City, Missouri. In addition, various Smithfield departments contribute their time to local food banks throughout the year. In 2017, we plan to further expand Helping Hungry Homes employee volunteer opportunities.

The Smithfield Foundation also considers food insecurity to be one of its top giving priorities. This past year the Foundation made a \$10,000 donation to the Campus Kitchen at Virginia Tech, a student volunteer-led program to deliver surplus food from university dining halls to local hunger relief organizations. Since September of 2015, the Campus Kitchen has brought 14,500 pounds of food to people in need, while also educating students about the issues of food waste and food insecurity. The Foundation's donation supplements other areas of cooperation between Smithfield and Virginia Tech, including support for research on sustainable food production.

We are also staying engaged in food insecurity challenges at a broader policy level in our headquarters state of Virginia. Since 2015, our senior vice president of corporate affairs, Keira Lombardo, has provided regular input on the Commonwealth Council on Bridging the Nutritional Divide, which seeks to tackle food insecurity while growing the state's agricultural industry.

Case Study: Driving with Pride

Smithfield is proud to provide high-quality protein to individuals in need. But we don't do it alone. We also rely on a team of dedicated donation truck drivers who take just as much pride in what they do.

Take, for example, Carl Greene, who works with C.R. England, a national trucking company that handles many of Smithfield's philanthropic and retail deliveries. He also has a passion for volunteering at local food banks, so when he heard that Smithfield was looking for donation truck drivers, he jumped at the opportunity to reach even more people.

"I had the benefit of being on the retail side, working at a pantry, when you distribute food to the hungry and you see the need, you see the joy in their faces when now they can feed their families," says Greene. "I've been doing donation drives for Smithfield for a little over a year, and it is extremely rewarding. We're hauling 30 to 35 thousand pounds of protein to the food banks, and you know you are affecting a lot more people."

A veteran who served two tours of duty in Vietnam, Greene began his trucking career late in life. After retiring as an investment advisor and vice president at a bank a few years ago, he quickly grew bored and decided to embark on a second career as a truck driver. The 70-year-old hasn't looked back since.

"I am having the time of my life doing this and going out and meeting people," he says. Smithfield donation deliveries have taken him from Florida to Alaska and connected him with unique opportunities, such as meeting players from the Kansas City Chiefs and driving around the famed Daytona Speedway in Florida.

Still, the best part for Greene is the ability to bring food to those in need. "It's the most satisfying thing I have ever done," he says. "When you see people who are hungry and you pass out food to them and you see that relief in their brow, you can't help but have your heart swell up."

Case Study: Helping Front Line Responders During Times of Crisis

When Baton Rouge, Louisiana, was deluged with unprecedented flooding in August 2016, Michael G. Manning, president and CEO of the Greater Baton Rouge Food Bank (GBRFB), immediately began preparations to respond to the emergency. He couldn't predict that the nonprofit would become a victim of the flooding as well.

Over the course of several days, some areas received as much as 30 inches of rain, while rivers and waterways swelled to record levels. Thirteen people were killed and some 140,000 households were displaced as a result of the floods. As extreme rainfall lashed the Baton Rouge area, Manning and his team staged hundreds of thousands of pounds of food for distribution to affected areas. But before they could ship the food out, the GBRFB facility flooded with four feet of water, destroying 600,000 pounds of product.

"It's the first time a Feeding America food bank was directly impacted by a disaster to which we were supposed to be responding," says Manning.

"It was perfect timing when Smithfield stepped up to help us. It couldn't have been scripted better for us to be able to get the protein into the diets of people affected by the floods."

Still, they were able to salvage packaged and canned goods that had been stored above the water line, and Manning and his team began setting up a temporary warehouse and supplying a local Salvation Army distribution site. Later that month, Smithfield Foods' donation trucks arrived with approximately 80,000 pounds of protein. Because Manning's team had set up at a makeshift site with limited refrigeration, GBRFB relied on the refrigerated Smithfield trucks to safely store the meat, as well as other products requiring refrigeration, until distribution.

"That was key to our ability to introduce protein into the network of distributions," says Manning. "It was perfect timing when Smithfield stepped up to help us. It couldn't have been scripted better for us to be able to get the protein into the diets of people affected by the floods."

Ultimately, 10 of the 11 parishes that GBRFB covers were part of the federally declared disaster zone. Further compounding the difficult recovery, many affected residents did not have flood insurance, as they were located outside the designated flood plain where federal insurance is required. Many lost their jobs as businesses were forced to rebuild, and the extra costs of cleaning, remediation, and reconstructing homes have led to higher demand for support from GBRFB. Meanwhile, local donations have declined, the result of regular donors redirecting disposable income toward flood-related repairs.

"We saw that people who had gotten out of line and no longer needed assistance prior to the flood were now coming back to our agencies because they had lost so much," says Manning. The organization usually serves roughly 90,000 to 100,000 unique individuals every year, many of them on a recurrent basis. In the months after the flood, GBRFB began a mobile pantry service to ensure people had enough food for the holidays.

Manning points to a long road ahead to recovery for both the Baton Rouge community and for GBRFB. Restoration of the flooded facility is expected to cost at least \$1.4 million, in addition to replacing machinery, electronics, and furniture. In total, GBRFB lost \$1 million worth of food and spent \$2 million on cleanup costs following the flood.

"It's just a tremendous sea change for us and for our community," he says. Still, he remains optimistic. "We're encouraged by people coming up and stepping up big-time as we face the new normal that we have to deal with as we move forward."

Education

At Smithfield, we believe that education has the power to dramatically strengthen communities over the long run. In line with our social purpose, we support existing education programs in areas where we live and work and also seek to create unique and new learning opportunities.

Since its founding in 2002, the [Smithfield Foundation](#), a nonprofit organization that acts as our company's philanthropic wing, has focused on funding educational scholarships for children and grandchildren of employees, as well as other educational partnerships.

In 2016, the Smithfield Foundation expanded its hallmark scholarship program to include four additional schools—the University of Nebraska, the University of Missouri, North Carolina State, and North Carolina Agricultural & Technical State University—and we saw applications rise by nearly 50 percent. This year, we awarded a total of 95 scholarships totaling nearly \$400,000, up from around \$300,000 in 2015. In order to be eligible, a student must be a dependent of a Smithfield employee, demonstrate financial need, and be accepted by one of 10 schools we have named as partners. Since the inception of this program, we have awarded 553 annual scholarships worth more than \$3.3 million.

The Smithfield Foundation also makes other donations in support of education. In 2016, we gave a total of \$125,000 to Virginia State University and the Benedictine Education Foundation to fund scholarships. Since 2005, we have also supported student scholarships at Christopher Newport University (CNU) in Newport News, Virginia, providing \$10 million in grant money for CNU's scholarships to date. In addition to funding those scholarships, Smithfield's donations help support the University's Leadership Program, the Luter School of Business, and other programs.

In 2006, the Smithfield Foundation began funding Learners to Leaders[®], a national education alliance of local educational partners that works to close the education gap for underprivileged students in our employees' communities. In 2016, we began to wind down this program, but we will continue to fund one of our most successful partnerships—the Science Bound program, a partnership with the Denison, Iowa, Community School District and Iowa State University. Science Bound is a rigorous five-year college preparation course focused on encouraging students of diverse backgrounds to pursue higher education degrees in math and science. Those who successfully complete the course earn a four-year scholarship to Iowa State if they pursue a degree in science, technology, math, or engineering (STEM). To date, we have provided 26 students with tuition-free scholarships through the Science Bound program.

The Smithfield Foundation is now looking toward other areas of education where we can make a significant impact. In Virginia, where we are headquartered, community leaders and education experts have raised attention to the issue of early childhood education. In 2016, we made a \$40,000 donation to the Virginia Early Childhood Foundation to support its programs on child school-readiness. We have also recently begun to widen the Foundation's scope of impact to support other community aims of our company, namely, veterans and hunger relief.

One program we have supported extensively is An Achievable Dream (AAD), a Virginia-based organization with the mission to provide economically disadvantaged students with the tools and resources they need to succeed in life and become successful, productive citizens. Smithfield has sponsored the college scholarships of two classes of AAD's graduates in 2006 and 2015. This year, we contributed to AAD's Annual Fund, which ensures that the K–12 students AAD serves receive a high-quality education through the organization's social, academic, and values-based curriculum. In addition to its financial support, our employees regularly volunteer at AAD's middle school and high school in Newport News to share with students real-world and work lessons with students—such as teamwork, punctuality, work ethic, and other big-picture topics—that teach them skills to help them become productive employees in the future. The Smithfield team of employees is dedicated to sharing their work and life experiences to prepare AAD students to be college-, career-, and citizen-ready while also exposing students to career opportunities that they may otherwise not know exist.

We also seek to respond to the specific needs of local schools in our communities. In 2016, we made donations in the form of scholarships, school supplies, and additional forms of assistance to local school districts in North Carolina, Utah, and other locations.

Encouraging the Next Generation of Farmers

We are proud to support the development of the next generation of farmers. We partner with Future Farmers of America (FFA) and 4-H to create a future where students of agriculture will discover their passion in life and build on that insight to chart the course for their educations, careers, and personal futures.

In 2016, we participated in nearly 40 FFA and 4-H events and made a variety of donations, including a 22-acre plot of land in Algona, Iowa, that local FFA students use to raise corn and soybeans, which they then sell to raise money for FFA events and scholarships. In total, Smithfield donated nearly \$28,000 to FFA and 4-H programs in 2016.

Case Study: Supporting Schools in Our Own Backyard

In early 2017, Smithfield Foods made a \$3 million donation to Isle of Wight County Schools, which will fund an innovative and multifaceted educational program known as the Smithfield Foods Legacy Project.

The gift—the largest the school district has ever received—will fund a comprehensive education project aimed at preparing students for a range of future careers.

The Smithfield Foods Legacy Project includes a new, state-of-the-art MakerSpace facility at Smithfield High School that will offer 3-D printers and other technologies that facilitate hands-on student research and design. The school, located in our headquarters community in Virginia, will also receive a Junior Reserve Officer Training Corps (JROTC) fieldhouse to provide additional training and classroom space for students interested in pursuing military careers. A new multipurpose pavilion to host community events and student exhibitions will also be built on campus as part of the project.

“This project will help us better train our students to think critically and collaborate effectively during their education and throughout their careers, and would not have been possible without this generous support from Smithfield Foods,” says Dr. Jim Thornton, superintendent of Isle of Wight County Schools.

The Smithfield Foods Legacy Project is part of a wider initiative at the school district to revamp its career technical education offerings, including plans for engineering, welding, and health sciences labs, along with culinary training facilities.

The \$3 million donation reflects our company’s support for innovative educational programs that better prepare students for a range of careers after graduation, whether or not they pursue a college degree.

Case Study: Helping Young Students Achieve Their Dreams

Miliyah White, a freshman at Fayetteville State University, has always been in a rush to get into the professional world.

The 19-year-old North Carolina native entered an early college program at the university when she was a freshman in high school, and is taking extra classes to graduate with a nursing degree two years ahead of schedule, in 2018.

White is one of 95 students who received a scholarship from the Smithfield Foundation in 2016. Every year, the Foundation awards grants to children and grandchildren of Smithfield employees who attend one of 10 eligible universities. In 2016, we awarded nearly \$400,000 in scholarship funds, up from \$300,000 in 2015.

“I have known for a long time that I wanted to be in the medical field, doing something fast-paced,” says White, whose father, Lonnie White, works as a maintenance supervisor in Smithfield’s Tar Heel facility. When she was in the ninth grade, she found out about the Smithfield Foundation scholarship.

“I was always hopeful about the scholarship,” she says. “I was going to go to college regardless of whether or not I got it. But it’s great because now, after I graduate, I won’t have to worry about debt. I can instead concentrate on my studies, which I really need to do.”

White’s nursing program curriculum, with a minor in health care management, involves a heavy load of math and science courses. After she graduates, she hopes to secure a nursing job in one of the larger cities in North Carolina.

“This scholarship was really good because that was a way of Smithfield showing appreciation for my dad and it makes the burden easier for my parents when it comes to paying for school,” she adds.

Like White, another Smithfield Foundation scholarship recipient, Josef Rogers, has had a similarly clear view of his future from a young age. “Since eighth grade I knew I have wanted to be an actuary,” says the sophomore at Iowa State University. An Iowa native, he is now pursuing that goal with a double major in mathematics and statistics.

Rogers’ father, Greg Rogers, has worked at the Smithfield facility in Denison, Iowa, for the past 25 years. Josef Rogers qualified for a \$2,000 annual scholarship for the duration of his undergraduate studies—a major boon for the young student.

“Without this scholarship I would have had to take on a job, which would have been tough,” says Rogers. “Not only did the scholarship allow me to have more time to focus on my studies but it also allowed me to have the time to meet more people, including some of my closest friends.”

Rogers also participates in several extracurricular clubs, is a member of a fraternity, and is active in community service efforts.

“On top of having more time, the scholarship has given me extra motivation to work hard,” he adds. “No matter what obstacle may stand in my way, I know I can do it with Smithfield’s support.”

While he still has several more years of college ahead, Rogers says he plans to pursue a master’s degree and then find work as an actuary.

Support for Military Families

Part of Smithfield's social purpose is to honor the service and sacrifice of American veterans and their families, mainly through partnerships with nonprofits that work directly with military families, as well as employee-led events that celebrate and support local veterans.

We are stepping up our commitment to veterans with **Operation 4000!**—a Smithfield Foods initiative to employ 4,000 military veterans, or 10 percent of our domestic workforce, by 2020.

Our work with charitable organizations and local veterans groups also continues. Our partnership between our Eckrich® brand and Operation Homefront, a national nonprofit focused on building strong and stable military families, is now in its fifth year and our cumulative donations have surpassed \$2.5 million. Working in conjunction with our retail partners, Smithfield also has provided selected military families with additional support, including free groceries; unique NASCAR, college football, and country music-themed experiences; backyard make-overs; and new cars.

Operation Homefront provides assistance for service members and their families—in the form of financial, healthcare, and other types of aid—in times of need and places a special emphasis on supporting the recovery of wounded warriors. The organization also works to make sure that military members and their families receive the recognition that they deserve.

Our Smithfield locations also organize local events to help military families living in their areas. For example, in 2016, our Kansas City office hosted a Veterans Day luncheon that gathered around 150 people and presented two local veterans and their families with cash prizes totaling \$10,000, along with a company car. The donations were entirely funded by employee donations to our Good Cause Friday programs.

Our Warsaw, North Carolina, farming facility hosted several military events, including a Wounded Warrior Project Soldier Ride that uses adaptive bicycling events to raise money and boost morale for injured veterans. Our Hog Production operations also hosted a Military Fun Day event and Military Appreciation Day (MAD), where volunteers take active duty troops out for a full day of offshore fishing, followed by a huge southern-style cookout. This year over 1,200 active duty and retired military personnel, along with their families, attended MAD, making it the world's largest "Take the Troops Fishing" event.

Health & Wellness

Smithfield works to support health and wellness among all of our employees for the many positive business benefits it offers, including greater productivity, improved job satisfaction, and higher quality of life.

Supporting health and wellness initiatives in the communities where we live and work has similar benefits. In recent years, we have been sponsoring the American Heart Association (AHA) to help improve cardiovascular health—a major issue across the United States—in our communities. This year, Smithfield supported the Richmond, Virginia, chapter Heart Ball, an annual fundraiser that raised a record \$1.2 million—thanks, in large part, to the leadership of Smithfield CEO Ken Sullivan. Smithfield contributed \$140,000 in sponsorships and donation matches. Vendors that work with Smithfield also contributed \$225,000 to the organization.

In 2014, our Hog Production operations began a fundraising program for the AHA in several area middle schools. Students raise money on behalf of the AHA while also learning about the importance of eating right and exercising for a healthy heart. In addition, Smithfield donates CPR kits to participating schools. CPR training is a requirement for high school graduation in the region, but many schools struggle to afford the expensive kits necessary for realistic training. In 2016, our Warsaw, North Carolina, office donated full CPR kits to eight area schools as part of the program. We are also sending Smithfield employee volunteers to run CPR education classes for students, as well as teacher training sessions in local schools.

Smithfield is also working to help build a healthier environment in schools. In 2016, we partnered with a mobile app company to deliver the Smithfield School App to more than 5,000 schools nationwide. This tool facilitates real-time incident reporting and aims to stop student bullying, a serious problem at many schools around the country. One in five students report being bullied at school, and severe bullying has been linked to teen suicide. The incident-reporting function allows students to immediately share any bullying incidents, threats, mental health concerns, or other issues directly to school administrators. It also gives parents, teachers, and students access to real-time information about a range of school-related topics, including closures and safety alerts.

Read more about our [employee health programs](#).

Disaster Assistance

In 2016, we responded to some of the largest and most serious natural disasters of the year—the flooding in Baton Rouge, Louisiana, and Hurricane Matthew in North Carolina. In Baton Rouge, we donated 80,000 pounds of food to the Salvation Army following devastating floods. During Hurricane Matthew, which caused widespread damage in the vicinity of Smithfield facilities, our employees put forth extra time and energy to safeguard both company facilities, including animals in our hog production unit, and their surrounding communities. Smithfield also gave \$25,000 to the Red Cross to support their humanitarian efforts in areas affected by the hurricane. In addition, we donated \$10,000 and over 75,000 pounds of protein to Operation BBQ Relief, which provides hot meals to those displaced by a disaster.

Environmental Stewardship & Community Beautification

Smithfield's approach to environmental sustainability covers not only our own operations, but also extends to preserving and protecting the ecosystems upon which we all depend.

Across our company, we work to raise awareness about critical environmental issues among our employees and our communities through on-the-job and community service activities. Smithfield employees also regularly volunteer in local cleanups and beautification projects to encourage responsible stewardship of the land.

Community Improvement and Beautification Projects

Every year, Smithfield employees across the country donate their time to help improve their local communities. In 2016, our employees volunteered in a total of 55 community beautification projects around the world. See the [International section](#) for examples of community beautification projects in Poland and Romania.

Our U.S. projects in 2016 included the following:

- **Community Cleanup Week.** In May, Smithfield employees in Missouri participated in a companywide community cleanup leading up to Memorial Day, volunteering their time to help clean roadways and other public spaces.
- **Princeton Elementary Playground Installation.** Over the summer, Smithfield employees in Missouri volunteered a total of 178 hours to help a local school, Princeton Elementary, install a new playground before the start of the new school year.
- **Middlesboro "Clean the Canal" Event.** In April, Smithfield hosted the fifth annual "Clean the Canal" event in downtown Middlesboro, Kentucky. A team of employee volunteers teamed up with a local cleaning contractor to remove more than 70 pounds of trash and debris from the banks of the Yellow Creek Canal so the area could be opened up for fishing and recreation.

Envirothon

The [National Conservation Foundation's Envirothon project](#) (NCF-Envirothon) is an annual academic challenge that engages 50,000 high school students in real-world environmental problem solving. The goal is to develop the next generation of dedicated and informed citizens ready to take on the challenges of environmental conservation. NCF-Envirothon organizers work with local conservation, forestry, and education experts to create curriculum and field experiences that train student teams in five categories: soils and land use, aquatic ecology, forestry, wildlife, and current environmental issues. Teams from across the United States and Canada participate in state and provincial competitions to advance to the NCF-Envirothon finals, and competition finalists receive cash prizes.

In 2016, we continued our annual \$75,000 sponsorship of NCF-Envirothon. We also set a goal to have 100 percent of our farms and facilities participate in some way in the program, either through direct volunteering or donations to local teams. Smithfield employees serve as program volunteers, helping student teams in their communities learn about environmental conservation, or judges at local competitions. For example, employees at our Kansas City location volunteered at the Missouri Envirothon competitions at both the regional and state level, and employees from the Middlesboro, Kentucky, plant made connections with local school officials to help start a new Envirothon team at a school. Our Smithfield, Virginia, headquarters also provided the state's winning team, from a school in Augusta County, with a \$1,000 gift to purchase study materials in preparation for the national finals competition in July.



Our Commitment to Employees

At Smithfield, we are committed to being a people-oriented company. By unleashing the full potential of our employees, we can reach our full potential as an organization.

In 2016, we continued our efforts under “One Smithfield” to unify our workforce and our independent operating companies under one holistic corporate umbrella. Moving our human resources functions to a single structure will enable us to better serve our employees. To oversee these changes, we created a new companywide vice president of human resources; meanwhile, our chief people officer—a position created in 2015—continues to lead our strategy on employee retention and engagement and building on a more cohesive and innovative company culture.

Our People Vision

To create an exceptional employee engagement culture that nurtures and rewards companywide loyalty and focuses behavior on the customer at all interactions.

In 2016 we embarked on a major new goal to increase the number of veterans in our workforce. Through **Operation 4000!**, Smithfield has pledged to employ 4,000 military veterans—or 10 percent of our domestic workforce—by the end of 2020. The initiative will focus on hiring skilled candidates with prior military service while working harder to retain and engage veterans already in our workforce. Operation 4000! is part of Smithfield’s long-standing commitment to **supporting our country’s veterans**, as well as building a more diverse and talented workforce.

We know that our 52,000 employees are our greatest asset, and we strive to create a fair, ethical, and rewarding work environment. We want employees to spend their careers at Smithfield, and we are developing new ways to make the experience of working at Smithfield a more enriching

and fulfilling one. We place a priority on promoting employees internally and support education opportunities, including internal training, scholarships, and tuition reimbursements, which can advance employees' careers.

Employees at a Glance

More than 52,000 strong across the globe

Turnover 23.8%

Approximately \$735,000 in education programs

Responsibility, Operational Excellence, and Innovation Awards

In 2016, Smithfield introduced a new class of awards for employees who improve our company by exemplifying three of our key principles—Responsibility, Operational Excellence, and Innovation (ROI). The ROI awards are designed to inspire and encourage individuals and teams to strive for excellence and to build a better, more sustainable future for our company and our communities. Employees at all levels of the company are eligible to apply or be nominated, and winners receive a \$5,000 award.

The first group of winners are as follows:

- **Responsibility.** Gerry Ness of our St. Charles, Illinois, facility received the Responsibility award for his work as a mechanic in the packaging department. Ness exemplifies the spirit of responsibility through his excellent attitude and problem-solving abilities, continually going above-and-beyond his required duties, and helping other mechanics or those in other departments who need assistance. He has also volunteered for several safety teams and has implemented a number of safety improvements in the plants, including ergonomic adjustments to regularly used equipment.
- **Operational Excellence.** This year's Operational Excellence award went to three team members—Greg Meek, Brucker Garcia, and Zachary Eyring—at our sow production unit in Yuma, Colorado. Over the past several years, these three have led the charge on several initiatives that have helped transform our Yuma operations from one of the lowest-producing and highest-cost locations to one of our most successful. The team focused on employee engagement efforts and improvements to the sow production system, including a new pig care program that is based on animal behavior. Through their efforts, employee turnover decreased from 55 percent to 23 percent, our employees are more engaged, and production has become more efficient.
- **Innovation.** The Smithfield Agronomics program, led by three individuals in our Warsaw, North Carolina, hog production operations—Rachel Carr, Dawn Williamson, and Kraig Westerbeek—won the Innovation award in 2016. The program grew out of a request from one of our largest customers to try to improve the efficiency of fertilizer use in our grain supply chain. Working with the nonprofit Environmental Defense Fund, we created a program that provides agronomic information and technology to local farmers to improve fertilizer use efficiency, crop yields, and soil health. [Learn more.](#)

Value Creation

We create value through the employment of 52,000 people, many of them in rural areas where there are limited job opportunities. Our operations also contribute to the economic stability and development of local communities, where we purchase goods and services and where employees reside.

By the Numbers	2016
Total salaries and wages (including bonuses and stock options)	\$2.0 billion
Total benefits (including pension)	\$306.5 million
Total compensation expense (excluding payroll taxes)	\$2.3 billion



To develop and maintain a skilled workforce, we invest in employee training, workplace safety, and health and wellness activities. These programs can have an impact on our bottom line, particularly around the following issues:

- Workplace safety;
- Workers' compensation costs;
- Absenteeism;
- Employee satisfaction and engagement; and

- Turnover rates.

Employee Relations

Our commitment to our employees is at the core of our company. We have a responsibility to ensure that our employees are not only treated with respect at all times, but that they are also given opportunities for career advancement and long-term, fulfilling employment.

We are committed to meeting the needs and addressing the concerns of employees at every level of our company, from recruitment to retirement.

We engage with employees through management safety committees and other means, and we have taken steps across our operations to evaluate—and enhance—employee satisfaction. Employee Resource Groups (ERGs) are an expanding area of focus for Smithfield as we seek new ways to create a more supportive and engaging environment for our workforce. We also offer competitive wages and benefits, educational scholarships, and a variety of continuing education and personal enrichment programs.

Our Workforce by Segment		2016
Fresh Pork and Packaged Meats		34,058
International		11,517
Hog Production		4,903
Corporate		224
Total		50,702

Workforce figures as of the end of 2016, prior to the acquisition of Clougherty Packing LLC, which added around 2,000 people to our employee total. About 42 percent of our U.S. workforce is unionized, and substantially all our employees are full time. About 73 percent of our workforce is compensated based on hourly rates.

Our U.S. Workforce by Age and Gender	Female	Male	Under 30	30-50	Over 50	Total
Governance bodies (leadership)	8	44	0	14	38	52
Number of full-time employees	13,486	24,329	7,494	19,675	10,646	37,815
Percentage of employees	35.7%	64.3%	19.8%	52.0%	28.2%	

We do not have a substantial number of part-time or seasonal employees. Therefore, we do not report them separately. Smithfield's work is not substantially performed by workers who are legally recognized as self-employed, or by individuals other than employees, including employees and supervised employees of contractors. Our workforce did not experience any significant variations in employment numbers in 2016. All figures represent the domestic workforce as of the end of 2016.

Employee Engagement, Recruiting, and Retention

Over the past several years, we have made concerted efforts to lower employee turnover through a variety of safety and employee engagement programs, and we're proud that our average turnover rate stands at around 24 percent. While our rate has been decreasing over recent years, we are committed to even further reductions, aiming to have an average turnover rate below 20 percent.¹ We have achieved our relatively low turnover rate through a strong focus on employee engagement, workplace safety, health and wellness activities, and maintaining a competitive compensation and benefits package. Our ultimate goal is to make Smithfield a place where employees can find satisfying careers, not just temporary work, and gain the knowledge and expertise needed to continually advance within the company.

We have been expanding our employee engagement programs but have encountered challenges reaching our hourly workforce in the same way as our salaried workers. Because of the differences in the day-to-day work life of these two groups, we recognize a need to think in new ways about how and when to connect our hourly workers with new Employee Resource Groups, health and wellness programs, and other internal initiatives.

Team Smithfield

In 2016, we rolled out Team Smithfield, an employee engagement initiative focused on strengthening company culture and building internal support for Smithfield's **social purpose and mission**. Team Smithfield is comprised of employee-volunteers who act as internal company advocates. They regularly share information on company programs and initiatives within the workplace and encourage colleagues to participate in Smithfield events. Team Smithfield members receive a branded "member kit," including Smithfield clothing, and can share ideas with each other through communication resources such as our intranet and quarterly teleconferences.

Our goal is to recruit 1 percent of our domestic workforce, or about 400 people, to serve on Team Smithfield. As of the end of 2016, 350 employees had already signed on.

Team Smithfield members participated in a variety of employee engagement activities in the first year of the program. For example, before Thanksgiving, team members in Smithfield, Virginia, developed the "Blessing in a Box" campaign to give back to employees during the holiday. Of the 30 employees nominated by their coworkers, 13 were chosen to receive a donation box containing everything needed for a Thanksgiving meal. Because so many donations were received this past year, Team Smithfield plans to continue the program in 2017.

Local Employee Engagement Activities

Each Smithfield facility has its own unique relationship to the surrounding community, and many of our employee engagement activities are planned on the local level. Human resources and plant management teams at our facilities are constantly looking for new opportunities to better integrate Smithfield into their communities, while also giving employees a chance to access meaningful events and activities.

Every year, Smithfield employees participate in hundreds of local events, including Local Hero Appreciation Days honoring first responders, Envirothon, holiday donations, community clean-ups and cook-off competitions.

As the world's largest pork producer, Smithfield plays a vital role in providing nutritious, cost-effective protein sources to consumers around the globe. Every one of our employees helps us fulfill this mission through their daily efforts at Smithfield, or through direct community action. In December, for example, employees at our Virginia headquarters ran a local food awareness campaign that ultimately raised 13,000 pounds of food for the Food Bank of Southeastern Virginia.

Rethinking Recruiting

Finding the right people for the right jobs is a perennial challenge for most industries, and this is especially true of the meat industry. More and more baby boomers are heading toward retirement, and there are fewer people entering the industry to replace them. We are keenly focused on not only retaining our current talent, but also on attracting our next generation of employees at Smithfield, where they can have the opportunity to produce "Good food. Responsibly.®"

We regularly recruit at colleges and universities across the United States, as well as internationally, with a focus on Internship, Manager-in-Training, and Career Foundation Program roles. As part of our transition to "One Smithfield," we are finding greater synergies between recruiting activities across different locations and operations. Our human resources team has also worked to establish a consistent brand identity across all recruiting

divisions to help expand the talent pool; in 2016, we established the [“One Smithfield” Careers page](#) to centralize job listings across all domestic segments.

¹ We do not currently track employee turnover by age group or gender, although we do track turnover regionally at each of our segments except International.

Talent Development

Retaining the best talent requires constant support and training so that each individual can continue to grow—and so that we can grow even stronger as a company.

At the supervisory level, we encourage managers and supervisors to be equipped with the right skills to excel at their jobs, while also helping others become better at theirs. Across our operations, we conduct a number of supervisory trainings to continue to ensure strong leadership across the company.

Our Smithfield Leadership Institute and Emerging Leaders programs target employees with management potential, helping to prepare them for new roles with greater levels of responsibility. Every year, we also conduct our Top Gun Leadership Program, a 12-month commitment to strengthen and develop high-performance leaders through formal classroom training with case studies, executive briefings, and team projects.

We offer our Manufacturing Excellence: Understanding Yields, Labor, and Quality Program to help frontline managers understand the business operations of the company, including hands-on instruction about yields, margins, and cost efficiencies, as well as meat science and meat processing techniques.

A number of locations also offer Spanish classes for English speakers who want to improve channels of communication with their Spanish-speaking colleagues.

Mentorship Opportunities

At the beginning of 2016, we kicked off the ACHIEVEmentorship Program, our first formal mentorship program that matches individuals with a more experienced mentor based on their interests and expertise. The initial six-month session drew around 350 people, with an 80 percent positive feedback rate according to a survey of participants. Despite the positive feedback, participation in the second session was down to around 300, which we attribute to the high time commitment of the program. The creation of the ACHIEVEmentorship Program has been a learning process, and we are working to improve program outcomes for all participants.

Mentoring Goes the Extra Mile

For some, our ACHIEVEmentorship Program helps illuminate new career pathways. For example, Lindsey Ahlen, a mentee who works in the international group out of our Kansas City, Missouri, office, has found new exposure to the type of data analysis work she is most passionate about through the program. But for others, like her mentor, Steve Brier, the program has helped shine some light on what he is already doing.

“Helping Lindsey understand what I do has helped me understand better what I do,” says Brier, who is a production director at our hog production facility in Nevada, Missouri. With a history of teaching classes on leadership and development, Brier was attracted to the mentoring program because it offered a chance to interact with new faces. “I enjoy the interaction, I enjoy working with other people,” he says.

Ahlen, who has a master’s degree in agricultural business, was eager to learn about the animal science side of our operations, specifically animal care. She is also interested in expanding her family’s hobby farm. As part of the mentorship program, she was able to visit Brier at a Smithfield farm in Missouri to see the work first hand.

“It was eye-opening,” she says. “You don’t realize how many steps there are. The more questions I asked, the more I realized how much I don’t know.”

Over the last half of 2016, the pair have had a standing weekly phone appointment. They discuss farming constraints and solutions to get around them, how to use resources, and have even read and discussed a popular book about farm management.

The two work on different ends of the Smithfield supply chain but have been able to collaborate on an issue somewhere in the middle: order variation. When customers change their order quantities over time, it becomes more difficult to predict potential supply shortages for certain products. Brier arranged for Ahlen to spend some time with another colleague who works on this program through data analysis—an area that Ahlen hopes to work in in the future. Working with Brier and others, Ahlen has been able to hone her data skills, which could get her closer to her “ideal job.”

“It could help us both out,” says Brier. “It could help our customer, it could help our company, and it could help Lindsey to do data analysis and do the job she wants to do. Because she wants to grow in our company, she has a chance to do that.”

Educational Opportunities

Education is an important part of our employee engagement strategy, and our employees often need to learn skills in order to gain a promotion within the company.

In addition to our many on-the-job training programs, we offer support for employees who are going back to school to earn college or graduate degrees. To help employees pursue their educational goals, we offer a tuition reimbursement program for eligible employees. In 2016, this program provided over \$735,000 to employees continuing their education.

Our company’s philanthropic arm—the Smithfield Foundation—also provides scholarships for the children and grandchildren of employees, among other initiatives. In 2016, we provided scholarships for 95 students, totaling around \$400,000. [Learn more.](#)

In addition, we offer online training geared toward workers in our office locations as part of the Smithfield University program. Available through our company intranet, Smithfield University courses can be self-led or instructor-led and offer a range of topics, including computer skills, leadership trainings, sales knowledge, and public speaking and communications.

We are continuing to see growing interest in our Career Foundation Program from both recruits as well as managers. The program, which was launched in 2014, brings in 25 recent college graduates as new employees and enrolls them in 18- to 24-month rotation periods in several areas of our business. In 2016, our applicant numbers rose sharply from 332 the previous year to 1,299. Whether they’re focused on engineering, operations, or business management, these employees spend six months each in three to four positions at our company under the mentorship of a key business unit leader. The program allows employee participants to understand more clearly the specific challenges and opportunities that we face, while also

giving them a valuable and holistic understanding of the company's work. This helps to not only strengthen their skill set and identify future career paths, but also helps to build a well-rounded talent base within the company.

Benefits

Competitive wages and benefit programs vary according to facility, location, and position. In 2016, the average hourly wage for all Smithfield business segments was \$20.32—nearly three times the current federal minimum wage of \$7.25 an hour. Hourly positions are hired locally whenever possible.

Comprehensive health insurance and benefits packages are offered to employees in recognition of the value employees bring to the company. These include 401(k) and pension plans, life insurance, and vision and dental care. Smithfield has made more than \$580 million in voluntary pension contributions over the last three years. With these contributions, the pension plan is more than 90 percent funded.

Diversity & Inclusion

Workforce demographics are changing in significant ways across all industries, including the meat industry. As baby boomers begin to retire in large numbers, Smithfield and many other companies face a challenge in attracting new talent.

We understand that our success depends in large part on fully leveraging the unique strengths of everyone who comes through our doors with a desire to build a career with us. We also understand that our consumer base is very diverse, and we strive to make our workforce more reflective of the people who buy our products.

On the whole, the meat industry tends to employ large numbers of minorities and women in lower levels of employment, such as production and processing. But there is far less diversity in the higher rungs of management. At Smithfield, we are trying to correct this trend by taking a more deliberate approach to recruiting under-represented groups at all levels of the organization. We participate in industry groups, such as the Agriculture Diversity and Inclusion Roundtable and the STEM Food & Ag Council, which are focused on engaging the next generation in STEM-related careers in the agriculture industry.

Supporting Our Vets

Smithfield has a long history of supporting military families through food donations, volunteerism, and collaboration with partner organizations like [Operation Homefront](#). Now, we are taking that support to another level through [Operation 4000!](#)—a new initiative to employ 4,000 veterans at Smithfield Foods by 2020. This goal represents 10 percent of our domestic workforce, up from 3 percent of current Smithfield employees who have prior military service.

We believe that this is not only the right thing to do for the country, but also the right thing to do for Smithfield. We are constantly looking for skilled workers with a technical background. Meanwhile, a large number of qualified veterans are seeking long-term employment. These men and women have faithfully served our country and embody one of our core principles—responsibility. Operation 4000! will help Smithfield continue to fulfill its mission to produce “Good food. Responsibly.®”

We announced Operation 4000! in November of 2016, and we expect to begin full-scale rollout in the first quarter of 2017. Our recruitment efforts will rely on local hiring managers, with distinct hiring goals for our individual locations. We plan to engage directly with military transition offices, which provide resources for families returning to civilian life, in areas where we operate to help facilitate the recruiting process. While we will continue to post all open positions on employment networks that serve veterans and transitioning military personnel, our hiring teams also plan to leverage our regular military-related brand events, for example with Eckrich® and Operation Homefront, to raise awareness about job opportunities for veterans.

We are also planning to launch a new veterans-focused Employee Resource Group (ERG) called Smithfield Salutes, to ease the transition of veterans into the company and provide support resources for existing employees with prior military service. Smithfield Salutes’ participants will also aid local hiring managers in outreach and recruitment efforts.

Expanding the Pipeline

Smithfield is committed to increasing diversity at all levels of the company. As part of this, we are adjusting and expanding the way we recruit employees.

In 2016, we set new diversity goals for our companywide internship program, which provides a small group of students an opportunity to experience the work culture of Smithfield. In 2017, we aim to bring our internship diversity percentages up to 30 percent people of color, up from 7 percent this past year. We are also committed to maintaining a 50/50 split between men and women in the program.

The internship program is also steadily expanding. In 2016, Smithfield hosted more than 100 interns who were recruited for a range of positions across our organization, including roles in finance, engineering, animal care, and marketing. Participants toured Smithfield facilities and received training courses that provided a broad overview of the company, as well as “lunch and learn” events that aimed to teach workplace skills such as effective communication. Through the program, students took part in key management meetings, participated in meaningful projects and community

outreach, and became integral members of the Smithfield team.

In addition to the many animal science programs from which we have traditionally recruited employees, we have expanded hiring outreach at historically black colleges and universities and schools associated with the Hispanic Association of Colleges and Universities. These include Virginia State University, North Carolina Agricultural and Technical State University, Norfolk State, New Mexico State, and Texas A&M.

Employee Resource Groups (ERGs)

ERGs are a valuable way for Smithfield to engage with our people while creating new professional and personal connections among employees across all levels and divisions. Over the past few years, we have expanded the number of ERGs at Smithfield, which has been well received. At the same time, we recognize that most ERG participation comes from our salaried workforce, and we are exploring ways to better engage our hourly employees.

We recently added two new ERGs—one aimed at female employees and the other at millennials—to help facilitate a network for talent development and learning opportunities across the company.

The Women's Connect ERG was initially started in 2013, but was reinitiated in 2015 after a pause in activity following the transition to "One Smithfield." Membership in the group has steadily expanded to reach 540 people in 2016, compared to around 400 the prior year. The group organizes lectures, panels, networking events, and other enrichment opportunities that help support its four "core competencies": Leading Business, Leading Culture, Leading People, and Leading Self.

Our Smithfield NEXT group was launched in 2016 as part of our work to expand the definition of "diversity" beyond just race and gender to also include age and thought processes. The group connects employees of the millennial generation to learning, networking, and development opportunities. But membership has not been limited to just millennials—employees from all age groups have shown interest in the speaking, networking, and community engagement opportunities arranged by group leaders. For example, during a kick-off event for Smithfield NEXT, millennial expert Ryan Jenkins was invited to discuss employee engagement across generational lines and Smithfield company culture. More than 250 Smithfield employees attended the event.

And for national Hunger Action Month in September, over 65 employees donated their time at food banks around the country as part of a series of volunteering opportunities organized by Smithfield NEXT. Employees from several offices volunteered at food banks in southeastern Virginia, Kansas City, Missouri; Cincinnati, Ohio; and Lisle, Illinois. Altogether, volunteers helped these food banks distribute more than 16,000 pounds of food to those in need.

Both the Smithfield NEXT and Women's Connect leadership teams include representatives from our plants, farms, and offices across the country. We are also exploring the needs of other groups in the company and plan to launch a new ERG focused on African-American employees in 2017.

We do not discriminate against any employee or any applicant because of race, color, religion, ethnic or national origin, gender, sexual orientation, age, disability, veteran status, or any other status protected by federal law. The company works hard to provide employees of all backgrounds with opportunities for training and advancement at all levels. All facilities adhere to our Equal Employment Opportunity policies and programs.

We are proud of the progress on diversity that we have made in the last year and are continually aiming to be the best in our industry, but we also acknowledge that there remains room for improvement.

2016 Employee Diversity	Executives	Hourly employees	Salaried employees	Companywide
American Indian or Alaskan Native	0%	1.2%	2.0%	1.4%
Asian	2.9%	9.4%	1.9%	7.3%
Black or African American	2.9%	35.6%	13.9%	29.7%
Hispanic	0.7%	31.6%	16.8%	27.6%
Native Hawaiian or Other Pacific Islander	0%	0.1%	0.2%	0.1%
Two or More Races	0%	0.7%	0.6%	0.7%
White	93.4%	21.5%	64.7%	33.2%

Employee Wellness

The ability to live a healthy life that includes work-life balance is an important part of our commitment to our employees. We believe that investing in employees' health and well-being pays dividends in the long term. Healthy employees feel better, perform better, contribute to a more positive work environment, and drive down overall company healthcare costs.

Work in the meat industry can be extremely demanding, and our employees often work long hours. Finding ways to emphasize a healthier work-life balance is a top priority for Smithfield, and we are looking for new ways to provide greater support to our employees, including newly created Employee Resource Groups, mentorship programs, and healthy living resources.

Technology-Fueled Healthy Habits

We have a wellness program that provides direct incentives to salaried employees, encouraging them to form healthy habits. Participants are given a Fitbit™ fitness tracking device after they have completed a biometric screening, an initial health assessment, and joined at least two of several health activities offered by Smithfield. The program launched as a pilot in 2015, limited to around 500 salaried corporate employees, and has since grown to 5,000.

Over the course of the year-long program, the Fitbit tracks everyday activity levels, and participants earn points based on Fitbit data. Participating employees who earn a total of 100 points over the year receive a \$600 wellness bonus. In an encouraging sign, approximately 80 percent of participants received the bonus in the first year.

Based on the initial success of the program, we are planning further rollouts. The next phase will expand the program to salaried employees at our production plants. Looking further ahead, we are working on finding a wellness incentive program that can also meet the unique needs of our hourly employees.

We also continue to offer more traditional health and wellness programs, which vary from location to location across the company. Some examples include hiring a full-time personal trainer for employees, professional counseling services, blood pressure and cholesterol screenings, free mammograms, massages, intra-office weight-loss competitions, flu shots, and more.

Promoting Healthy Behaviors

Our "fit" wellness program, which is offered to employees at several locations, represents our commitment and responsibility to support good health for employees and their families. It offers enhanced benefits, such as diabetes management, smoking cessation programs, and maternity management for a healthy pregnancy—including a \$200 gift card for new parents. We also host regular "lunch-and-learn" events to discuss healthy living topics such as stress management, weight control, and employee assistance program services.

Several offices offer annual health fairs that include blood pressure screening, cholesterol checks, massages, mammogram screenings, and more. In 2016, our Tar Heel, North Carolina, plant hosted its first health fair in 10 years. Local vendors and medical professionals showcased services available in the area, while insurance benefits administrators educated employees about health benefits.

Weight Loss and Exercise

In 2016, we worked with local Weight Watchers® chapters to launch a formal participation program for employees at three corporate locations. These programs add on to other, more informal weight loss and exercise programs at other offices. For example, some locations offer to reimburse employees 50 percent of the Weight Watchers joining fee if they complete the majority of their weigh-ins and meetings, while other offices host on-site gyms for employee use. Several of our employees are even certified yoga instructors who lead regular classes for their colleagues.



Going Casual for a Cause

At our corporate offices, we offer employees a Jeans Day for a Good Cause Friday program. People who want to dress down once a week can contribute \$5 to a collection that we then donate to local charities. In 2016, we raised nearly \$53,000 that we distributed to a variety of charities, some of which serve the regions around our offices and some that serve national organizations.

Health & Safety

The meat industry has long been associated with dangerous and hazardous work. However, injury rates across Smithfield facilities are significantly better than the industry average—and often better than the national average for all industries combined.

Smithfield is constantly working to improve our safety performance at all of our locations. We have greatly improved our Total Incident Frequency Rate (TIFR), which dropped from 6.58 in 2008 to 3.75 in 2016. Between 2015 and 2016, our TIFR rate decreased by more than 8 percent. Over the past five years, Smithfield has achieved a TIFR below 4.0; and, for four of the past five years, the rate has been lower than the national average for all industries.

Our Health & Safety Goal

- Reduce employee injury rates

Our Health & Safety Targets

- Continue to reduce Total Incident Frequency Rate (TIFR) and maintain levels below general industry average
- Achieve annual Days Away, Restricted, or Transferred (DART) results better than the general industry average
- Increase safety engagement level to 30% of employees

Our long-term improvement in workplace safety stems from our ambitious targets to meet or beat industry averages for the three performance metrics we report to the U.S. Occupational Safety and Health Administration (OSHA): Total Incident Frequency Rate (TIFR); Days Away, Restricted, or Transferred (DART); and Days Away from Work Injury and Illness (DAFWII). In 2016, these metrics showed steady improvements across the board. Our DART rate dropped to 2.65 from 2.9¹ in 2015, a 9 percent reduction, while DAFWII showed a 4 percent year-over-year reduction, from 0.79 to 0.75. As noted above, Smithfield's TIFR in 2016 was 3.75, compared to 4.08 the previous year.

As part of the move to a more unified "One Smithfield," we have standardized health and safety policies across our plant locations, which we believe has helped us achieve an overall improvement in our safety performance compared to the prior year. We remain committed to making further gains in this area and are proud of our above-average safety record in the industry.



¹ Note that after publication of our 2015 report, Smithfield revised our numbers slightly upward: DART went from 2.80 to 2.90, DAFWII went from 0.76 to 0.79, and TIFR went from 3.99 to 4.08.

Standardizing Safety

As part of our “One Smithfield” initiative, we recently created a new corporate-level position of senior safety director to centralize health and safety operations across the entire company.

We also named a core team of safety leaders who report to this new safety director across five strategic areas: Fresh and Packaged, Hog Production, Training Development & Statistics, Industrial Hygiene and Fleet Safety, and Safety and Regulatory Compliance.

Prior to this change, each operating company within Smithfield had its own safety director that reported only within its own segment. We believe our new approach will create a more holistic, standardized safety culture that will improve safety and build a more cohesive company culture.

In addition, we are continuing to standardize our health and safety programs and policies across Smithfield, including our international locations. As part of these efforts, we are finding innovative new ways to disseminate information among our employees, such as our interactive safety trainings. In 2015, we began creating computer-based training courses that cover a range of safety topics. Since then, we have expanded course offerings, including customized lessons based on the unique needs of certain locations. To date, approximately 3,100 employees have enrolled in an online safety course.

Specific trainings for plant-level safety managers were created in response to a common challenge across our company: Safety managers working on the floor have very little time to schedule in-person follow-up training classes outside of their day-to-day tasks. By moving the course material to a digital platform, safety supervisors are able to complete the necessary training at their own pace, thereby spending less time in a classroom and more time on the plant floor eliminating hazards.

The interactive courses are built through a software program that allows us to customize the material with animated videos, voice-overs, and quizzes that give immediate feedback on incorrect answers. Quiz results are recorded, and our management team is able to analyze responses on an individual and group level to identify any gaps in understanding and respond accordingly. Course topics are selected based on an analysis of companywide safety audits and employee feedback. Moving forward, we plan to create a series of modules focused on new supervisor safety orientation, designed to improve the efficiency of our existing orientation program and also to help new recruits coming from outside the meat industry better understand our safety operations.

Properly trained employees create value at every level of our company. The regular, high-quality training provided to team members enables them to work more safely, create a better work environment, and continue company successes.

Moving Toward International Standards

In 2016, we began a multi-year effort to align Smithfield’s Employee Injury Prevention Management System (EIPMS) with a new module developed by the International Standards Organization (ISO). ISO 45001 is the first ISO management system standard created specifically for safety and health management systems and will provide a new global benchmark against which organizations can be measured.

We expect that ISO 45001 will be widely adopted around the world and become a vendor requirement for many of our customers. We estimate that approximately 60 percent of our existing EIPMS standards overlap with the ISO 45001 guidelines. Our team will continue to work over the next two years to make our EIPMS fully compliant with ISO.

Employee Injury Prevention Management System



Case Study: Training Like an Athlete

In 2011, the Smithfield facility in Sioux Falls, South Dakota, was facing a challenge: Injury rates at the plant were not improving and stood at around 7.4, significantly higher than the company average.

So Ken Baptist, vice president of operations at the time, challenged the plant's safety team to develop a comprehensive strategy that could improve overall injury rates.

The team ultimately came up with a targeted safety strategy that has changed the way the plant approaches injury management. The team noticed that most of the injuries occurring at the plant were soft-tissue injuries, including sprains, strains, and tendonitis. In consultation with third-party experts, they discovered similarities between the types of injuries sustained at the plant and those of athletes. Both are usually the result of a repetitive or vigorous activity.

The Smithfield team began working with Avera Occupational Medicine to customize the firm's "Industrial Athlete" program—which applies concepts of sports medicine to the workplace—to the needs of workers at Sioux Falls. In 2012, the Sioux Falls safety team rolled out the Industrial Athlete Soft Tissue Injury Prevention Model, shifting from a reactive first-aid response to one emphasizing prevention, wellness, and employee involvement.

As part of the new approach, Sioux Falls changed the name of the first aid department to health services and introduced a new e-consult system (an online physician) to aid employees. They also hired Tammy Tjaden, an industrial athletic trainer tasked with bringing stretching, warm-up exercises, and improved posture and ergonomic techniques to the plant's 3,400 employees. Other early interventions would include bracing and taping techniques and health and wellness promotion. The Industrial Athlete program complements other safety initiatives at the plant, including an on-site massage therapist and ergonomics committees aiming to improve workstation design and employee work techniques.

"The Industrial Athlete concept was exactly what we had been looking for," says Jim Fleming, health services manager. "Keeping healthy and fit and early reporting of soreness are the keys to optimal performance and reduced injuries. Having an athletic trainer on-site to lead this effort was an essential component in pulling it all together. The impact this has had on reducing and preventing soft tissue injuries has been truly impressive."

Since 2012, thanks to the Sioux Falls' team innovative approach and other safety programs, recordable incidents at the facility have halved, and lost time rates have decreased by about 70 percent. In 2016, Sioux Falls won the Smithfield Presidential Award for Health & Safety, and the safety team continues to find ways to evolve and improve injury prevention strategy.

For her part, Tjaden says she was "thrilled to have the opportunity to bring my expertise in musculoskeletal health to an organization of this magnitude."

Case Study: Making Truck Deliveries Safer

Smithfield Direct Store Delivery (DSD) got its start in Indiana in the early 1900s as a horse-and-wagon-drawn sausage delivery company under what was then known as Peter Eckrich & Sons.

Fast-forward to today, and that small Indiana outfit now has some 400 employees who transport 187 million pounds of food a year, including Eckrich® products, to 15,000-plus retail stores across the United States.¹

Keeping our people safe—while on the road and when loading and unloading products—is a top priority for us. According to federal statistics, injury and accident rates for truck drivers rank among the highest of any industry, accounting for 26 percent of all fatal work injuries in 2015.

DSD leases its trucks, replacing them every few years with ever-safer models as the lease agreements expire. In 2016, we rolled out about 150 new trucks with a collision mitigation/lane departure warning system that alerts the driver if the vehicle veers out of a traffic lane or is about to crash into slowed or stopped traffic. National statistics show that 42 percent of fatalities, and 20 percent of all accidents, are related to failure to stay in lane. We expect that all of our fleet—about 465 trucks in total—will have the lane departure warning system within the next few years.

Our delivery vehicles were the first medium-duty fleet trucks to hit the road with the new electronic stability control system, according to truck manufacturer Navistar, which called our commitment to the technology an “industry-leading decision” and a “significant milestone.”

Camera Ready

Two years ago, we began installing in-dash cameras in our fleet as part of an effort to better protect our employees and our company in the event of an accident. SmartDrive isn't intended to be a “big brother” watchdog. The two-camera system—one directed inside the cab at the driver, the other pointed out the windshield toward oncoming traffic—does not record constantly, and footage cannot be monitored remotely in real time. Rather, cameras only record when triggered by a G-force event, such as a crash or a sudden lane swerve, capturing 10 seconds before and 10 seconds after the incident.

With 400-plus trucks on the road each day, there are many recordings, ranging from the benign (e.g., hitting a pothole or a speed bump) to the more serious. Analysts with SmartDrive review the recorded episodes and send reports to us so we can understand the root cause of any incident and learn from it.

The footage captured has been illuminating for a variety of reasons. In some cases, we could clearly see that a driver was using a cell phone at the time of the episode—in violation of Smithfield's policy. We have a strict policy against cell phone use when driving, and anyone caught in violation for a third time is fired. To date, we have dismissed five employees who have violated the cell use policy.

“Our goal in DSD is that Smithfield will never be involved in a distracted driver-related casualty or serious injury,” says Patrick Sebring, vice president of DSD. “If drivers get caught a third time using a phone behind the wheel, they turn in their keys. There's no middle ground.”

The video footage also helps to demonstrate who is at fault in an accident. Historically, Sebring says, courts have sided against truck drivers and large companies in the event of a lawsuit. Individual drivers, as well as Smithfield Foods, can be held liable. The video footage, however, can establish who was in error. Recently, for example, a camera recorded a heart-stopping video of a DSD driver who suddenly had to veer out of the way when a wrong-way driver came speeding directly toward him. Fortunately, neither driver was injured.

Sebring notes that some employees initially rejected the idea of cameras in trucks, concerned that the company would be watching their every move. But they quickly understood why cameras are important—and how they could help protect the drivers from false accusations of wrongdoing behind the wheel.

About three-quarters of our trucks now have the cameras, and we expect to equip the rest in 2017.

Improved Equipment

Another recent improvement to the vehicles has had a measureable impact on safety. Prior to 2014, our delivery employees accessed the cargo in our trucks using straight up-and-down folding ladders, similar to what one might see in a swimming pool. Workers would walk up forwards and down backwards, all while carrying heavy boxes of products.

We saw that this presented a serious risk of accident and injury. So we added lift gates that moved up and down automatically, enabling employees to load and unload products using handcarts. But those initial lift gates didn't have any safety barriers, so some employees continued to suffer injuries when a handcart veered off the platform.

After coming up with the initial concept, a group of DSD operations employees worked with a lift gate company to design, construct, and install new lift gates on our trucks. The handrails, which must be engaged before the employee can use the lift gate, have reduced related injuries by as much as 80 percent.

The addition of lift gates earned us second place in the 2016 National Safety First Awards.

¹ DSD represents only a portion of Smithfield's business, covering smaller retail chain stores and independent grocers nationwide. DSD delivers Smithfield brands, as well as a variety of frozen (non meat) foods produced by other companies. The rest of Smithfield's meat production operations rely on third-party truck companies for national distribution.

Injury Prevention & Engagement

We encourage employee engagement in safety processes at all levels of the organization as we work to improve our safety performance. In 2015, we formally increased our target of employee safety engagement to 30 percent and surpassed that goal the same year with 45 percent engagement. In 2016, our safety engagement level increased further to reach 47 percent.

We promote worker participation in safety program reviews and development of new systems. Many locations maintain employee safety teams, which can bring fresh perspectives to safety challenges and successes. As part of our efforts to standardize safety processes under “One Smithfield,” we are also working to increase safety engagement among our international teams.

In 2016, our behavioral risk improvement (BRI) program was active at nine Smithfield locations. The BRI program encourages hourly employees to observe each other and prevent at-risk behavior to reduce the potential for injuries and illnesses.

Each year, we host a Safety Conference, bringing together leaders from across our company. Approximately 150 Smithfield employees attended the 2016 Safety Conference, including safety professionals, as well as management personnel from operations, engineering, and maintenance. Also in attendance were Smithfield executive leadership, along with personnel representing our international businesses in Romania, Poland, and joint ventures in Mexico. The conference covered a range of focus areas, including updates on company health and safety performance, discussion of ongoing initiatives from each segment of our operations, and reviews and rollouts of new operational controls. Notable industry topics like regulatory updates, process safety management, lockout/tagout, emergency procedures, and contractor management were discussed.

Auditing and Inspections

Consistent inspections and auditing of each facility is a key element of our success in reducing injury and illness rates. Each month, every Smithfield facility is required to go through a complete inspection, performed by safety and management teams. The inspection covers specific items and areas of each worksite and is reported monthly as part of the Smithfield safety scorecard process.

In addition to monthly inspections at every location, each segment of the business has an audit program that evaluates whether our Employee Injury Prevention Management System (EIPMS) is effective. The EIPMS audit focuses on hazard identification and injury prevention, supplemented with an overview of regulatory compliance. These efforts help us identify hazards and risks, as well as help us develop injury prevention solutions before employees are subjected to unnecessary risks.

We complement site-specific inspections with annual corporate audits conducted by teams trained and led by company-certified lead auditors. The results of these audits are addressed by the location’s EIPMS core team through its required management review process of the system.

Smithfield also undergoes external audits of compliance and hazard control programs at U.S. worksites on a revolving schedule. These audits, led by independent, third-party personnel with experience in the meat industry, complement the management systems audits through in-depth examination of injury and illness hazards control at a particular worksite.

During these third-party audits, we review operational controls, such as training, machine and tool safety, personal protective equipment, chemical safety, hearing conservation, and emergency planning and response, as well as employee engagement. We highlight the success stories from facilities that perform well and share their best practices with other sites. Facilities that score poorly on the audits not only must correct their practices, but they are also subject to more frequent audits. Failure to improve audit scores results in increased involvement from the director of health and safety and higher-level corporate leaders, if necessary, to facilitate improvement.

Workers’ Compensation Claims Management and Return to Work

Although we are very proud of our achievements in reducing employee injuries to unprecedented levels for our industry and all industries, on-the-job injuries still occur. We have established a comprehensive workers’ compensation claims management program with a dedicated Return to Work element that seeks to return every injured employee, wherever possible, to full and regular work once it is medically feasible to do so.

We are also working to better manage the costs associated with workers' compensation claims. This process includes the creation of a computer-based workers' compensation dashboard to help plant managers better understand compensation-related costs, the implementation of a fleet safety program with transportation operations, and the launch of an organization-wide fraud awareness and prevention program to bring attention to the issue of workers' compensation fraud.

To ensure we appropriately implement all of these elements of the program, we regularly monitor and report outcomes in a separate scorecard that is reviewed during our internal audit process.

Case Study: Achieving Voluntary Protection Program Status

The U.S. Occupational Safety and Health Administration (OSHA) implements what is considered the gold standard of employee health and safety management: the Voluntary Protection Program (VPP).

Our Salt Lake City, Utah, production facility recently achieved what few in the country, let alone the meat industry, have accomplished—VPP Star status, the most elite OSHA safety program designation. The fresh pork production plant was officially granted VPP Star status in December 2016, three years after first submitting its application.

VPP status has stringent requirements that are hard for most facilities to meet. Just to apply, a facility must maintain injury and illness rates below the national industry average for at least three years and be in compliance with all local, state, and federal safety standards. VPP Star status, the highest of two program classifications, is reserved for exemplary locations. Less than one-tenth of 1 percent of all employers in the United States receives this designation.

Smithfield has set an ambitious goal: All of our facilities must have a plan in place to apply for and achieve VPP status (or the state equivalent). The Salt Lake City plant was the first Smithfield facility to achieve this milestone.

“Even applying to the program was a big deal,” says Candice Collins-Stringham, the Salt Lake City plant’s human resources and safety manager. The team first submitted its application in 2013 and waited approximately 2.5 years until it received a response and was able to schedule an on-site inspection.

“One of the biggest challenges,” says Collins-Stringham, “was keeping employees engaged throughout the long application process.”

To keep morale up during the lengthy wait, in 2015, the team implemented Smithfield’s employee-driven Behavioral Risk Improvement (BRI) program. Under the BRI program, a team of employee-leaders identifies specific areas of improvement in safety behaviors and is responsible for achieving 100 percent safe behaviors for 30 consecutive days. This program was one of the most important drivers toward VPP status since employee engagement plays such a large role in achieving outstanding safety performance.

Plant managers recognize that achieving VPP Star status was a collective employee effort. “It really takes a village,” says Collins-Stringham.

The Salt Lake City facility, built in 1997, employs around 260 people and produces approximately 33 million pounds of case-ready pork chops a year.

As part of the VPP assessment, OSHA interviewed approximately 30 percent of our Salt Lake employees—no easy feat considering 14 languages are spoken at the facility. During a weeklong on-site audit, OSHA auditors cited a handful of minor infractions, such as a light fixture without a cover and damaged rack, which the Salt Lake City facility has since rectified.

“We’re really proud of our employee team here—we’re proud to say we’re one of the safest plants in America,” adds Bill Synowicki, plant manager.

“This award is for the people that take care of business and do the daily grind every day. We’re taking care of those people,” he says. “All employees go home in the same condition that they went to work in. That’s what’s most important.”

Smithfield is continuing to move toward our companywide goal of further VPP status, and our Employee Injury Prevention Management System (EIPMS) has kept us well-positioned to successfully achieve it. However, OSHA is faced with a large backlog of applications—so much so that OSHA offices in several states where we operate have requested that Smithfield submit our applications at later dates. Still, Smithfield intends to continue to pursue VPP status across our facilities and to work closely with OSHA to accommodate its schedule and advance the application process to the best of our ability.

Health & Safety Performance

We are extremely proud of the dramatic worker safety improvements we have achieved across our company in recent years.

While the average rate of injury among beef and pork producers in 2015 was 5.4 injuries per 100 employees, according to the U.S. Department of Labor's Bureau of Labor Statistics' most recently available data, Smithfield's injury rate for 2016 was 3.75 injuries per 100 employees.

In 2016, Smithfield posted strong safety performance in our U.S. Occupational Safety & Health Administration (OSHA) Total Incident Frequency Rate (TIFR); Days Away, Restricted, Transferred (DART) Rate; and Days Away From Work Injury and Illness (DAFWII) Rate, with decreases across all three safety measurements.

OSHA Total Incident Frequency Rate (TIFR)

The number of work-related injuries and illnesses per 100 employees that result in medical treatment has fallen substantially since 2008. In 2016, we saw a decrease of 8 percent in the TIFR compared to the previous year.

OSHA Days Away, Restricted, Transferred (DART) Rate

The number of work-related injuries and illnesses per 100 employees that result in an employee missing work, having restricted duty, or being transferred from his or her regular duty work assignment fell by 9 percent over last year.

OSHA Days Away from Work Injury and Illness (DAFWII) Rate

The number of work-related injuries and illnesses that result in one or more days away from work per 100 employees fell by 4 percent over the previous year.

TIFR, DART, and DAFWII Rates Compared with National Averages

YEAR	TIFR			DART			DAFWII		
	Smithfield	A&P	AI	Smithfield	A&P	AI	Smithfield	A&P	AI
2008	6.58	7.5	4.2	4.40	5.0	2.1	1.29	1.1	1.2
2012	3.42	6.3	3.7	2.22	4.3	1.8	0.65	1.0	1.1
2013	3.47	5.7	3.5	2.53	3.9	1.8	0.73	1.0	1.1
2014	3.45	5.5	3.4	2.48	3.7	1.8	0.64	1.0	1.1
2015*	4.08	5.4	3.3	2.90	3.7	1.7	0.79	1.0	1.0
2016	3.75	N/A	N/A	2.65	N/A	N/A	0.75	N/A	N/A
08-16 Change	-43%	N/A	N/A	-40%	N/A	N/A	-42%	N/A	N/A

A&P = National averages for animal slaughtering and processing industry

AI = National averages for all industries, including state and federal government

All values are calculated per 100 employees for a calendar year. National averages for meat industry and all industries are based on 2015 data from the U.S. Department of Labor's Bureau of Labor Statistics (BLS). Data were not yet available for 2016 at the time of this report's publication.

* After publication of our 2015 report, Smithfield revised our metrics upward slightly for the year: TIFR went from 3.99 to 4.08, DART went from 2.80 to 2.90, and DAFWII went from 0.76 to 0.79.

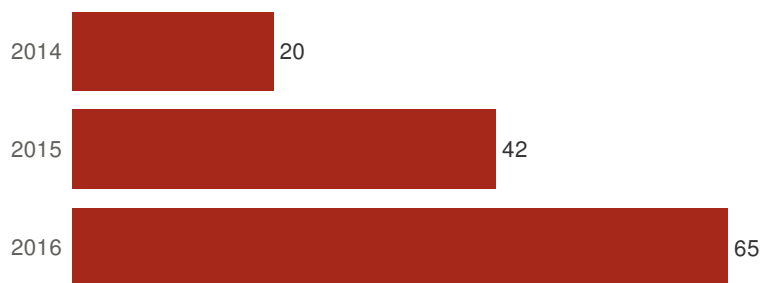
These rates illustrate how effective our safety management program has been over the long term. Our performance in 2016 was better across all measures than the previous years, continuing our significant, long-term gains since 2008.

OSHA Notices of Violation (NOVs)

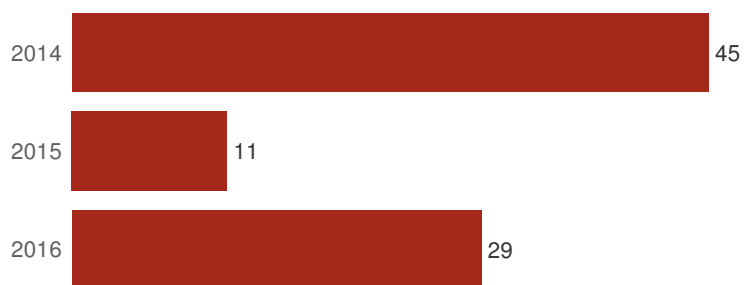
In 2016, Smithfield had 65 regulatory inspections conducted at locations across the country, receiving 29 citations with penalties totaling \$47,594. This marks an increase from 42 inspections and 11 violations in 2015, with a slight decrease in penalties from last year's total of \$49,095.

OSHA Inspections, Notices of Violation, and Penalties

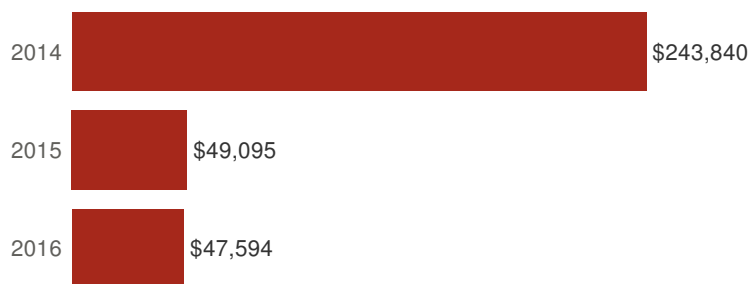
Inspections



Notices of Violation



Penalties



Case Study: BladeStop™ Technology Expands

While Smithfield, as well as the meat industry overall, has made great strides to make the production process safer for our workers, risks still remain. One of the greatest sources of danger within our facilities is hand-fed band saw operation.

We have automated as much of the cutting process as possible, mainly through the introduction of belt-fed or robotic saws. Over the past five years, we have been able to remove about 60 percent of manually fed band saws within Smithfield. Yet, because hogs vary in size and shape, certain cuts still require a human touch, and complete automation is virtually impossible.

“Our goal is to eliminate 100 percent of worker injuries due to manually fed band saws.”

“Band saws are the most dangerous piece of equipment in the meat industry,” says Gary Walters, Smithfield’s senior director of safety and health. “You have a rotating sharp blade that can remove fingers and hands because that’s what it’s designed to do—cut through bone and skin and meat. The band saw doesn’t know the difference between our process and a human being, and there’s no way to guard it.”

He adds: “Our goal is to eliminate 100 percent of worker injuries due to manually fed band saws.”

Fortunately, new technology around hand-fed band saw work can reduce the risk of injury. In 2015, we started introducing BladeStop™, a proprietary technology made by an Australian company that we believe to be one of the most innovative safety saw solutions available today. The BladeStop™ technology uses a sophisticated sensor system to quickly identify when the operator has come into contact with the saw. The saw is then mechanically shut down within 15 milliseconds of operator contact—a timeframe that can mean the difference between no injury (or a minor cut) and a potentially life-changing injury requiring stitches or even amputation. Smithfield worked extensively with the manufacturer to customize the saws to the particular needs of our facilities.

While the technology comes at a higher price, roughly twice that of traditional band saws, the added safety benefits are more valuable. After great initial success with our first BladeStop™ saw in our Smithfield, Virginia, location, we have added one additional saw in the same facility. Currently, we have 12 BladeStop™ saws in operation countrywide, with plans to add at least 20 more.

Recognition & Awards

External Recognitions

Our significant safety efforts continue to be recognized by our industry. In 2016, the North American Meat Institute recognized 31 of our facilities with worker safety awards.

Nine Smithfield locations received the Worker Safety Award of Honor, the highest award bestowed by the organization. The awards program is administered by the National Safety Council and based on evaluation of each eligible facility's safety record, as well as its implementation of various key components of an effective safety and health program.

The following received the Award of Honor:

- Bolingbrook, Illinois
- Charlotte, North Carolina
- Omaha, Nebraska
- Salt Lake City, Utah
- Sioux Center, Iowa
- Sioux Falls, South Dakota
- Wilson, North Carolina

Hog Production

- Land & Nutrient Management
- South Central Region

In addition to the locations highlighted above, 22 other facilities received Worker Safety Awards for outstanding achievements in workplace safety.

Internal Recognitions

Smithfield also has our internal Health & Safety and Workers' Compensation Awards program as part of the annual Safety and Workers' Compensation Claims Conferences. On the safety side, we presented five categories of awards to recognize outstanding performance. Three of the awards are performance-based awards, for which the winning facilities are selected through a scoring system that reviews their efforts against our vision of being an industry leader for worker safety and health.

During the review process, facilities are scored on a number of categories, including effective implementation of a health and safety management system that meets the requirements of Smithfield's Employee Injury Prevention Management System (EIPMS), monthly safety scorecard measurements, regulatory compliance and audit results, injury and illness rates, and implementation and developments toward other key initiatives such as U.S. Occupational Safety and Health Administration (OSHA) performance, Voluntary Protection Program (VPP) status, and Behavioral Risk Improvement (BRI).

The performance-based awards are the President's Circle Award, given to locations with outstanding performance for the year; the International Award, given to locations outside of the United States; and the coveted President's Award, given to an individual location with the highest level of performance.

Our 2016 performance-based award winners:

- President's Award—Omaha, Nebraska
- President's Circle:
 - Bolingbrook, Illinois
 - Charlotte, North Carolina
 - Clayton, North Carolina
 - Clinton, North Carolina
 - Hog Production Division (East region)
 - Hog Production Division (South region)
 - Omaha, Nebraska
 - Peru, Indiana
 - Salt Lake City, Utah
 - Sioux Center, Iowa
 - Springdale, Ohio
 - Wilson, North Carolina
- International Award—Opole, Poland

Two additional health and safety awards presented at the safety conference are the Safety Professional of the Year and the Innovation Award. Winners of these awards are chosen based on nominations from people and organizations across Smithfield. A panel of judges, consisting of internal personnel from each operating segment and our corporate headquarters, as well as several external partners that work closely with Smithfield in our worker safety efforts, reviews each nominee before deciding the winners.

Our 2016 Safety Professional of the Year and Innovation Award winners:

- Safety Professional of the Year—Candice Collins-Stringham, Salt Lake City, Utah
- Innovation Award—Granjas Carroll de México (joint venture) for its silo leveling project

Our Workers' Compensation Claims Management Awards program includes four individual award categories:

- **Claims Professional of the Year Award** recognizes that individual who has shown unequalled commitment to his or her claims management role within the organization and whose efforts have had a profound and measurable impact to injured workers, location, operating segment and/or the organization as a whole.
- **Workers' Compensation Innovation Award** is given to an individual or location whose creativity and innovation have generated measurable and meaningful financial savings or process improvement for the company.
- **Organizational Excellence Award** is intended to reward an individual location for its ongoing performance and sustained positive results in the area of claims management. This award measures results from the prior performance year in combination with historical performance.

Our 2016 Workers' Compensation Award winners:

- Claims Professional of the Year Award—Jim Fleming, Sioux Falls, South Dakota
- Workers' Compensation Innovation Award—John Pace, Hog Production Division (North region)
- Organizational Excellence Award—Springdale, Ohio

Human Rights

Our formal [Human Rights Policy](#) ensures the fair treatment of employees throughout the company.

The policy spells out the expectations we have in the areas of equal opportunity; health, environment, and safety; harassment and violence; the rights of employees; and other key topics.

We provide copies of the policy to all employees, including new hires, and encourage workers to call a toll-free hotline number to report any violations. We also communicate our Human Rights Policy to all major suppliers and expect them to comply. In addition, our [Supplier Code of Conduct](#) promotes adherence to all relevant laws and regulations, including those addressing slavery and human trafficking.

Our long-standing [Code of Business Conduct and Ethics](#) is also part of our governance framework and is designed to help create a safe and fair work environment. The Code is communicated to all employees and sets forth our expectations for appropriate employee behavior, as well as corporate hiring and disciplinary policies. For more information on ethics, see the [Governance & Management](#) section.

Policies & Statements

Human Rights Policy

Smithfield¹ is committed to the protection and advancement of human rights, as enshrined in the Universal Declaration of Human Rights (UDHR) issued by the General Assembly of the United Nations on December 10, 1948.

The Smithfield Human Rights Policy is grounded in the [Smithfield Code of Business Conduct and Ethics \(PDF\)](#) (the “Code”), and operates in conjunction with the Code. The Code, in conjunction with the Human Rights Policy, sets forth Smithfield’s policies and practices relating to conducting our business in an ethical and responsible manner that supports and respects the protection of human rights. It reflects the company’s core values and high ethical standards.

As used in this Policy and the Code, the term “Smithfield” means Smithfield Foods, Inc., and all foreign or domestic operations and joint ventures in which Smithfield has a majority interest and/or management responsibility, the terms “employees” or “representatives” mean and include all Smithfield employees, officers, and directors, and the term “supervisor” refers to the person to whom an employee reports. Smithfield will communicate this policy to its direct supply chain partners.

The Compliance Committee is responsible for the oversight and implementation of this policy, and shall define the company’s implementation and monitoring efforts to conform to this policy and advance our commitment to continuous improvement.

1. Equal Opportunity

Smithfield does not discriminate against any employee or applicant for employment because of race, color, religion, ethnic or national origin, gender, sexual preference, age, disability, or veteran status. This applies to recruitment, hiring, training, promotion, disciplinary practices, and other terms and conditions of employment. Discrimination against any employee or applicant for employment is a serious violation of equal employment opportunity law and of Smithfield’s corporate policies. It is the responsibility of every supervisory employee to ensure that discrimination does not occur and for every employee to report violations to our policy or the law.

Smithfield will take action to ensure that qualified applicants are given equal opportunity to be employed and promoted. All personnel actions and company-sponsored programs shall continue to be administered on a nondiscriminatory basis. Violations of policy will be reviewed, investigated, and appropriate action taken based on the facts.

2. Health, Environment, and Safety

Smithfield is committed to ensuring the health, safety, and well-being of our employees, the people living and working in communities near our facilities, and the environment and will provide the human, physical, and financial resources necessary to meet this commitment. These resources will be used to enable employees and contractors to work safely and comply with company policies and the law, to prevent pollution, and to protect the environment. Our employees are expected to comply fully with company policies and to adhere, at a minimum, to the applicable health, environmental, and safety legal requirements of their host country. Training will be provided to our employees on these company policies and legal requirements.

3. Harassment and Violence

Smithfield is committed to providing our employees with a non-discriminatory work environment free of any type of harassment per company policy and the law. Supervisory employees must investigate all complaints of harassment and employees are advised on their responsibility to report violations. The company will take appropriate disciplinary actions for violation of policy or law.

All verbal and physical threats of violent behavior are unacceptable and should be reported as outlined in the Smithfield Code of Conduct. Every report of violence or threats of violence will be investigated. Employees who engage in violence or threats of violence will be subject to disciplinary action, up to and including termination of employment as well as criminal prosecution.

4. Rights of Employees

Smithfield does not use forced or compulsory labor. Workers are recruited and receive competitive wages and benefit packages. Smithfield will not use child labor and respects the rights of children to be protected from economic exploitation. Smithfield recognizes and respects employees' rights and freedom to choose whether to join or not join third-party organizations or to associate freely and bargain collectively. Where applicable, Smithfield supports the rights of its employees to make these choices through fairly conducted secret ballot elections. Smithfield recognizes that in some countries workers are not free to organize and join unions, and in such circumstances the company is open to other forms of worker representation.

5. Implementation

This Human Rights Policy will be implemented by Smithfield through communication and training programs for staff on human rights issues generally, and on the requirements of Smithfield's Human Rights Policy specifically.

Health & Safety Policy

Smithfield¹ is 100 percent committed to the safety, health, and well-being of our employees. The safety of our employees is more important than our most valued customer. We strive to lead the industry in occupational safety and health just as we strive to be the industry leader in producing wholesome food products, animal welfare practices, and protecting the environment.

All operations are expected to implement an Employee Injury Prevention Management System and maintain improvements in the management of workplace injury and illness risks.

We further demonstrate this commitment to health and safety through:

- Identifying hazards, conducting risk assessments, and identifying control measures as well as development of processes and procedures for timely abatement and control of the hazards and risks associated;
- Maintaining compliance with all federal, state, and local regulatory requirements;
- Appointing safety coordinators at each location;
- Providing appropriate training to ensure awareness of potential hazards and competence in performing specific duties or job tasks in a safe manner;
- Promoting active participation in safety efforts by all hourly and management employees;
- Developing measurements and auditing systems to ensure that standards of performance are met and opportunities for improvement are identified; and
- Defining roles and responsibilities of all members of management toward health and safety to include review of goals and objectives during all annual and subsequent performance evaluations.

Maintaining a safe and healthful working environment is the responsibility of all employees. We expect all locations to maintain compliance with company and regulatory health and safety guidelines as well as implementation of other recognized good engineering and safe work practices. Smithfield Foods will manage worker health and safety as one of its core values to conducting business. It is with this in mind that the leadership at Smithfield Foods announces an expectation for each of our individual locations to establish and document formal objectives and management plans to achieve OSHA VPP status at the federal level or state-plan-state equivalent. This policy shall be reviewed and communicated to every employee as well as other interested parties involved in our operations.

Reviewed and accepted on this date: December 1, 2015

Diversity Statement

Smithfield¹ understands that its customers, employees, and suppliers are critical to its success as a global food company.

"Good food. Responsibly.®" Means a Commitment to Diversity

Smithfield understands that its customers, employees, and suppliers are critical to its success as a global food company. Smithfield is committed to partnering with customers, employees, and suppliers of diverse backgrounds and geographic locations, and to conduct our business in an ethical and inclusive way. Our global perspective and commitment to inclusion are central to our mission to produce good food, responsibly, and ultimately maximize shareholder value.

Therefore, Smithfield has established a Diversity Advisory Committee to help the company identify opportunities to strengthen relationships with our customers, our employees, our suppliers, and in the communities where we have operations.

Customers

Smithfield Foods is always seeking new markets for its products. We continually strive to reach out to a diverse customer base and produce good food that will be enjoyed by families across the globe. Our new initiatives include product development, marketing and advertising with diverse media outlets, sponsorships, and forming successful partnerships with key influencers.

Employees

Smithfield is committed to attracting, training, and maintaining a diverse workforce that is reflective of the marketplace. We strive to implement a company culture that is inclusive, positive, and performance-oriented. Having a diverse workforce allows us to benefit from a variety of perspectives and strengthens our global competitiveness.

Explore the many opportunities available across our family of companies. Visit our [Careers](#) page for our most recent employment information. Apply today!

Community

We believe that being an active and sustaining partner in the communities in which we operate is not only good business, but also our role as a responsible corporate citizen. Some examples of our activities include:

- Our Learners to Leaders® educational alliance, which provides learning opportunities to young people from disadvantaged backgrounds.
- College scholarships for the children and grandchildren of our employees, in partnership with numerous colleges and universities in the United States, including several historically black colleges and universities (HBCUs).
- Our Helping Hungry Homes® initiative, through which we partner with America's Second Harvest and local food banks to feed families in need.
- Our partnership with FFA to support young students in the educational quest for careers in the agriculture industry.

¹ All references to "Smithfield," "we," "us," and "our" are terms of convenience used to refer collectively to Smithfield Foods and all of its subsidiaries. Similarly, the terms "division" and "business unit" may be used to refer to one or more subsidiaries, which are independent operating companies.



Governance Overview

At Smithfield, we're passionate about producing good food, the right way. We aim to be an ethical food industry leader that sets industry benchmarks for sustainability.

We do this in part through sound governance and management principles and practices, which provide the foundations for trust, transparency, and progress at our company. Our systems for ethical conduct, the way we engage with stakeholders, our approach to public policy, and our management of supply chain issues are all important elements of our sustainability strategy, cutting across our key pillars and creating value for our company and for our stakeholders.

Smithfield Foods is a wholly owned subsidiary of WH Group Limited, a publicly traded company in Hong Kong. Operationally, we are part of an enterprise that shares our belief in global opportunities and our commitment to the highest standards of product safety and quality. Our CEO reviews the sustainability performance of our company on at least an annual basis.

In this section of our report, we discuss **ethics and compliance**, our **governance and sustainability management** structures, our **sustainability targets**, our **stakeholder engagement** efforts, and **public policy** issues of interest to our company. This section also discusses the results of our most recent **materiality analysis** that we used to better understand—and better report on—the issues that are of greatest importance to our company and to our stakeholders.

Materiality Analysis

Materiality, which identifies our company's key issues, plays an important role in our reporting. We use our materiality analysis and review process to shape content for our annual sustainability reports. As much as is practical, we weight discussion around the topics that have been identified as most important to our business and to our stakeholders.

We also use the results of our materiality analysis to guide our sustainability strategy and to manage the issues of concern to our stakeholders and to our company. This informed decision-making demonstrates our commitment to leadership in responsible food production.

We conducted our first materiality analysis in 2010, updated it in 2012, and then conducted a substantial update in 2015. For our 2015 analysis, we identified a list of potential material issues through interviews with internal and external stakeholders and by reviewing internal and external documents reflecting key stakeholders' points of view. Overall, we reviewed more than 75 inputs representing the perspectives of the company, employees, suppliers, regulators, local community members, industry organizations, nongovernmental organizations and activists, sustainability think tanks, customers, and consumers. This included nearly two dozen interviews with internal and external stakeholders. We then condensed and prioritized our issues based on stakeholders' level of concern and perceived impact to the company. We validated and finalized the analysis with a group of internal stakeholders and external sustainability experts before publishing the results in our [2015 report](#).

For this year's report, we reviewed our material issues to ensure that the topics had not changed substantially. We considered a number of inputs, including the United Nations' Sustainable Development Goals, which overlap with some of Smithfield's own goals and targets. We found that most of the issues, and their importance ratings, stayed the same as in our 2015 materiality matrix.

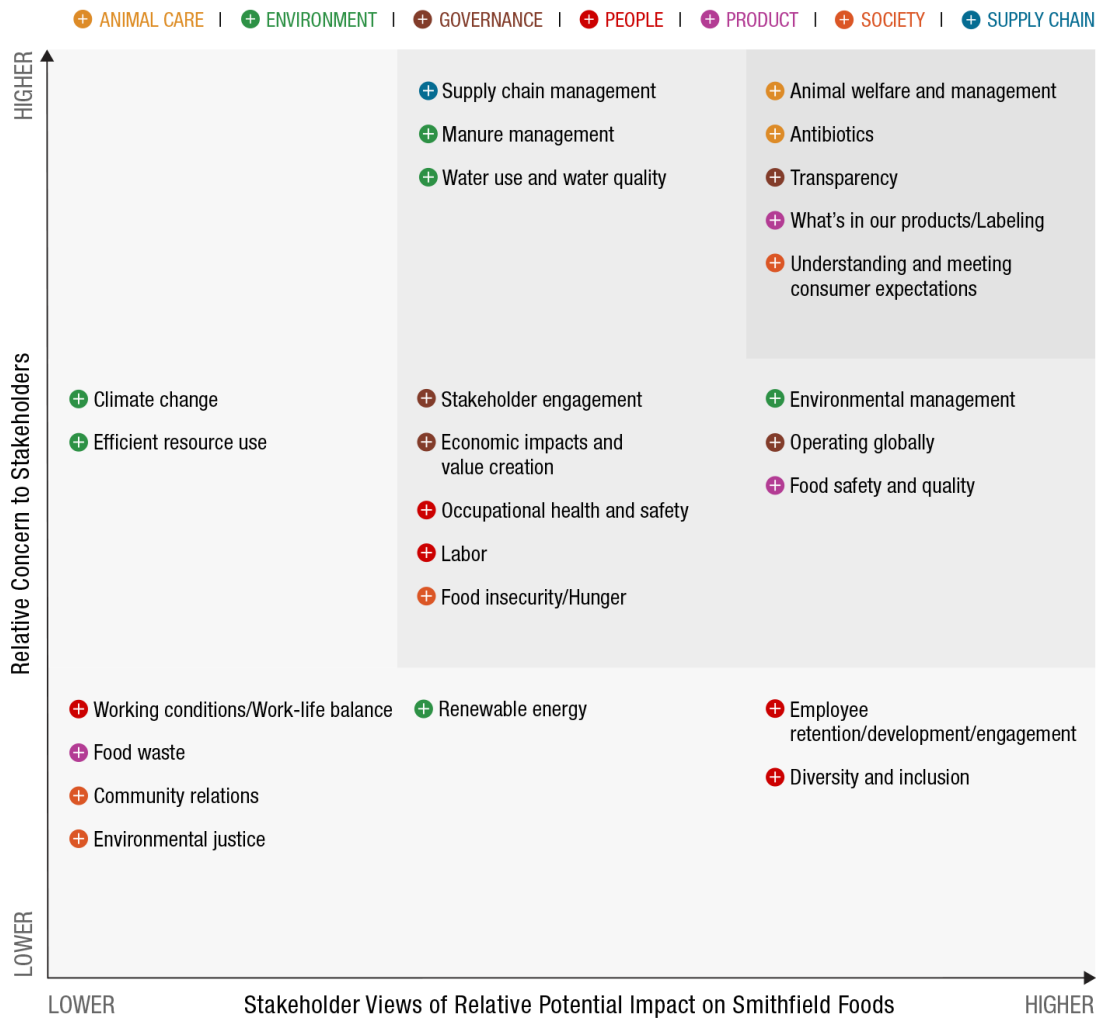
However, we did make a few changes. On environmental issues, we identified manure management and water use and quality as separate issues due to their ongoing importance in our industry and our own focus on managing them. (They previously had been aggregated into the categories of environmental management and efficient resource use.) We also added renewable energy as its own issue because of its growing global prominence and our own efforts.

Lastly, we broadened and clarified our supply chain management issue to better capture our engagement with contract hog growers, grain producers, and other suppliers on key environmental and social issues and performance.

The material issues listed below are the most critical to our company's ability to create and sustain value today and in the future.

Materiality Matrix

This matrix illustrates the results of our materiality analysis. Issues in the upper right box are most important to both stakeholders and the company. Issues are color-coded based on the broad categories used to organize this report.



What's included in our material issues?

Below we provide additional insight into how we define our material issues, including the boundaries of where the primary impacts associated with each issue occur. Internally, all of our material issues are relevant for all parts of Smithfield's business. Outside of our own operations, we assessed the importance and impact of issues across our value chain, from upstream in the supply chain to downstream product consumption and disposal. We also analyzed the stakeholders affected at each value chain stage. While recognizing that material issues may have indirect impacts on multiple stakeholders, we define the external boundaries based on external stakeholders who are directly impacted by each issue. We also identify the relevant Global Reporting Initiative (GRI) aspects associated with each of our material issues, a requirement of the "in accordance" level of the GRI G4 Guidelines.

Animal Care

Animal welfare and management

- Issue definition: Our policies and performance as they relate to the health, safety, and comfort of our animals
- External issue boundaries: Relevant to contract growers, customers, consumers, regulatory entities, nongovernmental organizations
- Related GRI aspects: Animal welfare

Antibiotics

- Issue definition: Our policies, practices, and administration of antibiotics; this issue includes stakeholder concerns about perceived overuse in the industry and antibiotics resistance
- External issue boundaries: Relevant to contract growers, suppliers, customers, consumers, regulatory entities, nongovernmental organizations
- Related GRI aspects: Animal welfare

Environment

Environmental management

- Issue definition: Our policies, performance, and systems for reducing our footprint and going beyond compliance
- External issue boundaries: Relevant for local communities, regulatory entities, contract growers, nongovernmental organizations
- Related GRI aspects: Compliance, environment overall, emissions, effluents and waste, water

Manure management

- Issue definition: Our policies, programs, and performance for managing manure; this issue includes our systems for treating and utilizing manure, as well as our programs to turn manure into a renewable energy source
- External issue boundaries: Relevant for local communities, regulatory entities, contract growers, nongovernmental organizations
- Related GRI aspects: Compliance, effluents and waste, water, energy

Water use and water quality

- Issue definition: Our policies and programs to manage fresh water use responsibly, especially in water scarce areas, and to eliminate water quality impacts of our operations
- External issue boundaries: Relevant for local communities, regulatory agencies, contract growers, grain suppliers, nongovernmental organizations
- Related GRI aspects: Compliance, water, effluents and waste

Climate change

- Issue definition: Addressing global climate change by reducing our carbon footprint
- External issue boundaries: Relevant to local communities, regulatory entities, nongovernmental organizations
- Related GRI aspects: Energy, emissions

Renewable energy

- Issue definition: Advancing the use of renewable energy, including finding innovative ways to turn manure into an energy source
- External issue boundary: Relevant to local communities, regulatory entities
- Related GRI aspects: Energy, effluents and waste

Efficient resource use

- Issue definition: Producing more while using less water, energy, and materials and generating fewer emissions and solid waste
- External issue boundaries: Relevant to local communities, regulatory entities, nongovernmental organizations
- Related GRI aspects: Water, energy, materials

Governance

Transparency

- Issue definition: Explaining what we do and how we do it through proactive and clear communications
- External issue boundaries: Relevant to contract growers, suppliers, customers, consumers, regulatory entities, nongovernmental organizations

Operating globally

- Issue definition: Addressing challenges related to diverse export markets, free trade, and risk management
- External issue boundaries: Relevant to customers, regulatory entities
- Related GRI aspects: Procurement/sourcing practices, market presence, anti-competitive behavior

Stakeholder engagement

- Issue definition: Working with our customers, regulators, investors, and others to understand their concerns and needs and to share our efforts to address them
- External issue boundaries: Relevant to local communities, contract growers, suppliers, customers, nongovernmental organizations
- Related GRI aspects: Local communities

Economic Impacts and value creation

- Issue definition: Creating value for our own business and for our customers, employees, investors, and society
- External issue boundaries: Relevant to local communities, contract growers, suppliers, customers
- Related GRI aspects: Economic performance, local communities, market presence, indirect economic impacts

People

Occupational health and safety

- Issue definition: Policies, practices, and performance related to keeping our people healthy and safe
- External issue boundaries: Relevant to regulatory entities
- Related GRI aspects: Occupational health and safety

Labor

- Issue definition: Creating jobs and career opportunities; this issue includes supporting farming in rural America while being mindful of challenges in the industry, such as immigration and lack of young people entering agriculture.
- External issue boundaries: Relevant to local communities, regulatory entities, contract growers, suppliers
- Related GRI aspects: Market presence

Employee retention/development/engagement

- Issue definition: Creating a workplace where employees want to stay and grow with us throughout their careers
- External issue boundaries: Relevant to local communities
- Related GRI aspects: Employment, training and education, labor/management relations

Diversity and inclusion

- Issue definition: Being an equal opportunity employer that values all our people and fosters an environment of diversity and tolerance
- External issue boundaries: Relevant to local communities, nongovernmental organizations
- Related GRI aspects: Diversity and equal opportunity

Working conditions/work-life balance

- Issue definition: Creating a work environment that allows for balance in employees' professional and personal lives
- External issue boundaries: Relevant to local communities
- Related GRI aspects: Employment, labor/management relations

Products

What's in our products/labeling

- Issue definition: Clearly communicating what's in our products; using labels to help our consumers make informed dietary choices
- External issue boundaries: Relevant to customers, consumers, contract growers, suppliers, regulatory entities, nongovernmental organizations
- Related GRI aspects: Customer health and safety, product and service labeling, compliance, marketing communications

Food safety and quality

- Issue definition: Producing safe, high-quality meat products for our consumers
- External issue boundaries: Relevant to customers, consumers, contract growers, suppliers, regulatory entities
- Related GRI aspects: Customer health and safety, product and service labeling, compliance

Food waste

- Issue definition: Reducing food waste through innovations in packaging and optimized logistics
- External issue boundaries: Relevant to suppliers, customers, consumers
- Related GRI aspects: Effluents and waste

Society

Understanding and meeting consumer expectations

- Issue definition: Predicting and responding to our consumers' evolving needs and preferences
- External issue boundaries: Relevant to customers, consumers, contract growers, suppliers
- Related GRI aspects: Healthy and affordable food

Community relations

- Issue definition: How Smithfield supports local communities through social outreach and engagement
- External issue boundaries: Relevant to local communities, nongovernmental organizations
- Related GRI aspects: Indirect economic impacts, local communities

Food insecurity/hunger

- Issue definition: Providing food to those in need
- External issue boundaries: Relevant to local communities, nongovernmental organizations, consumers
- Related GRI aspects: Indirect economic impacts, local communities

Environmental justice

- Issue definition: Understanding and addressing the potential for inequitable distribution of impacts and benefits
- External issue boundaries: Relevant to local communities, nongovernmental organizations
- Related GRI aspects: Emissions, local communities

Supply Chain

Supply chain management

- Issue definition: Working with contract hog farmers and grain producers to optimize performance on environmental and social issues and working with non-agricultural suppliers to minimize our use of resources such as cardboard and other packaging materials
- External issue boundaries: Relevant to contract growers, grain producers, suppliers, customers
- Related GRI aspects: Procurement/sourcing practices, indirect economic impacts

Ethics & Compliance

Safeguarding integrity remains a critical business priority. Ethical and lawful conduct is an essential part of our company's culture, and we are committed to conducting our business with the highest standards.

Smithfield maintains a **Code of Business Conduct and Ethics** for all employees and corporate officers. We publish the Code in the five major languages of the countries in which we have operations. It conveys policies and practices for conducting business in accordance with applicable laws and the highest ethical standards.

Our executive-level Ethics and Compliance Committee, chaired by our chief legal officer, oversees the full range of compliance issues for Smithfield and administers the Code. All executive officers are required to complete an annual certification relating to ethics and compliance, the Code, and other company policies.

We also provide employees with opportunities to report ethics violations or similar concerns through an anonymous telephone hotline. The company reviews and responds to all hotline complaints.

Our email Code of Conduct certification process promotes awareness of our Code and the values that we expect our employees to demonstrate in their day-to-day work. Each year, we send emails to the approximately 10,000 employees who have email accounts, and they must acknowledge compliance. Certain supervisory/managerial personnel who do not have active email accounts certify compliance by paper-based methods.

Sustainability Management

Overall management of Smithfield's sustainability program rests with the chief sustainability officer and a core team of senior managers and subject matter experts from business units and facilities.

This cross-functional team facilitates decision-making, recommends sustainability goals and promotes sustainability, reviews best practices, and coordinates and disseminates key sustainability data.

In Smithfield's business segments, coordinators are charged with communicating sustainability goals and targets through our operations. Each segment/location tracks individual progress to the goals, providing data through a centralized information gathering system.



We developed our sustainability management strategy more than a decade ago. At that time, we identified several sustainability areas that merited a more consistent management approach across the company to meet our goal of leading the industry with our practices. The first such area was environmental management. We implemented and certified environmental management systems at all farms and processing facilities. Over the years, we expanded that approach to other areas such as animal care and employee health and safety. We formed corporate committees to develop and implement consistent approaches, including committees focusing on environmental compliance, animal care, and food safety. Common elements of the management systems developed in each of these areas include policies, employee training, goal setting, corrective action, third-party auditing, and executive review.

International Operations & Acquisitions

While our sustainability program initially focused on operations in the United States, the program also applies to our operations in Europe. Of course, regulatory frameworks vary from country to country. Therefore, we, like many other companies, are working hard to align our goals and approaches to important issues, such as environmental management, with international operations.

In early 2017, we announced the **completion of the acquisition** of Clougherty Packing LLC, parent company of Farmer John and Saag's Specialty Meats brands, and PFFJ LLC farm operations from Hormel Foods Corporation.

When we acquire a new company, we conduct various reviews, including an assessment of the company's practices related to key sustainability areas such as employees, safety, and the environment. We also try to address the current relationship with local regulators and the communities in which they are based. Following an acquisition, we promptly implement our environmental and health and safety management systems (described in the respective areas of our sustainability program on this site) and identify practices already in place, as well as gaps. We then use our corporate-level training programs and intranet sites to communicate best practices.

We also make available our environmental management expertise and safety expertise to the companies in which we hold a minority interest, and we encourage them to utilize environmental and safety compliance practices that are consistent with our own.

Enterprise Risk Management

Risk management continues to be an important concept for Smithfield Foods. Since our first formal Enterprise Risk Management (ERM) assessment in 2012, we continue to enhance our ERM program as part of an effort to promote an aligned, integrated ERM framework across the entire company.

Our ERM program is based on the Committee of Sponsoring Organizations of the Treadway Commission (COSO)¹ ERM Integrated Framework. The objective of our ERM program is to have a sustainable process in place that can identify complex and emerging risks (both internal and external) that, if not addressed, might prohibit us from achieving our strategic, financial, and compliance objectives.

Through our parent company's (The WH Group) listing on the Hong Kong Exchange (HKE), Smithfield is now required to demonstrate that an effective ERM program is in place. This HKE requirement took effect for fiscal years ending as of Dec. 31, 2016. The WH Group, and, by extension, Smithfield Foods, must demonstrate that we have a formalized ERM program that includes, but is not limited to, risk identification and annual risk assessment, mitigation processes and controls, management and monitoring of key risks areas, and timely and effective reporting.

Although we had annually assessed our ERM program through a robust risk assessment process, a formal audit/evaluation of the effectiveness had not been performed. In 2016, to prepare for the first HKE reporting, Smithfield conducted an internal audit to assess the ERM program's effectiveness. Although we identified 22 key risk areas, the audit prioritized 10 key risks for the assessment, including commodity prices, food safety, planning and strategy, animal welfare, customer relations, environmental, international markets, capital adequacy, competitor activity, and ethics and compliance.

Based on the results of the internal audit, we believe that the employees responsible for each key area understand and own the risks for their specific parts of the business and that our ERM program meets the "effectiveness" definition as set forth by the HKE.

¹ COSO defines ERM as a "process effected by an entity's board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives."

Supply Chain Management

Suppliers are integral to our commitment to produce "Good food. Responsibly.®"

Our [Supplier Code of Conduct](#) helps ensure that suppliers continue to meet or exceed our high standards. The Code, which is incorporated into all new and renewed contracts with our largest suppliers, sets forth the business conduct requirements for all suppliers who do business with Smithfield.

The degree to which suppliers comply with the requirements—and the extent of their sustainability efforts—will be a consideration for future business with Smithfield. The Code outlines expectations around legal compliance, environmental sustainability, and business integrity, as well as labor and human rights issues. We monitor our suppliers' performance, although we do not conduct formal audits.

We maintain standardized vendor requirements, which include food safety, equal employment opportunity, and animal welfare guidelines, for all ingredient and packaging suppliers. (See the [Animal Care section](#) for a detailed discussion of management policies and practices around hog supply, including our relationships with contract producers.)

We also have surveyed our largest suppliers to understand what they are doing in areas such as energy reduction, natural resource use, employee safety, and community giving. Recently, we have been working with the Global Environmental Management Initiative (GEMI) on a supply chain harmonization project that's aiming to develop a standardized process for collecting, compiling, and sharing environmental and other sustainability information within and across value chains. The project hopes to generate a beta model for testing in 2017.

Sustainability Goals & Targets

We first adopted a series of ambitious environmental goals and corresponding targets in our domestic operations in 2010. We reached several of our targets ahead of schedule and, in early 2015, refined all of our goals and targets to better align them with our performance and with a new, more unified company structure.

In 2016, we added a new goal, one that we believe to be leading the protein industry. We aim to reduce our absolute greenhouse gas emissions by 25 percent by 2025. Read more in the [Environment section](#).

Also in 2016, we moved closer toward our goal to convert to group housing for pregnant sows on all company-owned farms in the United States by the end of 2017. Currently, nearly nine out of every 10 pregnant sows are in group housing systems.

Our goals and targets include an updated suite of environmental resource reduction targets. These goals build upon lessons learned and best practices that we have developed over the last few years. We intend to continue to push for improvements across our company, reaffirming our role as a leader in our industry.

Each of our goals is discussed in greater detail in the relevant sections of this website, including the [Transparency Scorecard](#). Going forward, we will continue to refine our goals and targets and adopt new ones as our sustainability programs evolve.

Stakeholder Engagement

We define stakeholders as all persons or organizations that are affected by the operations or practices of the company.

We routinely conduct internal analyses to identify stakeholders and have identified and defined the following stakeholders as groups we engage with regularly:

- **Internal stakeholders**, including employees, facility management, and corporate management, among others.
- **External stakeholders**, including the customers and suppliers with whom we do business; the end consumers of our products; federal, state, and local governments and regulatory entities; nongovernmental organizations; industry groups and trade organizations; and the communities in which our employees live and work.

Since the hiring of our first chief people officer in 2015, we have put particular emphasis on engaging with employees to acquire more input from them. In recent years, we have also increased our efforts around proactive stakeholder engagement, reaching out to a variety of groups to talk about who we are, what we do, and how we might be more responsive to each other's needs. These groups include members of the media, opinion leaders on issues of food production, religious organizations, and student groups. One area we've focused on is sustainable food production—an increasingly urgent issue as the world's population continues to grow. You can watch our video below: We engage with stakeholders in a number of ways and forums, and our communications vary depending on their respective needs. For example, we encourage suppliers to adopt practices that will reduce their impacts on the environment. We also make the most of the membership organizations to which we belong—communicating with third-party stakeholders, gaining perspective on important issues, and developing management tools others can use to improve performance. We engage with other stakeholders on an as-needed basis in response to particular issues that arise.

In addition, in order to meet our sustainability targets, we encourage our segments and facilities to meet with community stakeholders to highlight our programs and obtain input.

Other examples of engagement include the following:

- We funded research at the University of Minnesota’s NorthStar Initiative for Sustainable Enterprise that helped us better understand our environmental footprint. Environmental Defense Fund provided guidance as we developed our **greenhouse gas (GHG) reduction goal**. The GHG models built by the University of Minnesota will also help other protein companies quantify their environmental impacts.
- The government is an important stakeholder, and Smithfield continues to explore innovative initiatives with elected officials. For example, Smithfield is partnering with the **U.S. Environmental Protection Agency’s Nutrient Recycling Challenge**. This effort is designed to discover and promote innovative technologies that transform manure into cost-effective products that can be used by farmers.
- Our chief sustainability officer recently joined the board of directors of the Center for Food Integrity, a non-profit organization that shares similar goals with Smithfield of increasing transparency and understanding about modern food production and earning consumer trust.
- Our sales teams regularly engage with our customers (e.g., the supermarkets and retail chains, restaurants, and foodservice companies that buy our products). They highlight the work we are doing in the environment, including our new GHG reduction goal, and animal care, particularly around our commitments to **sow housing** and our industry-leading use of, and transparency around, **antibiotics**.
- We’re also engaging with our contract growers to provide guidance and advice on how they can convert sow housing on their farms.
- Increasingly, our customers are hearing from their customers—the ultimate consumers—about issues of concern to them. We participate in supplier surveys and communicate directly with customers, including working with our customers to develop approaches to issues ranging from animal care to nutrition to environmental and health and safety practices. We are responding in numerous ways, including offering products with ingredients that are easier to understand. The sales force, which provides the primary customer point of contact, communicates our approach to sustainability, so various team members can interact knowledgeably with customers on these issues.
- We participate in the North American Meat Institute (NAMI) Environmental Committee, which reviews regulations that affect our industry. NAMI’s annual conference promotes sharing of best practices in wastewater treatment, employee training, materiality assessment, chemical management, and other topics.
- We have helped the **Global Environmental Management Initiative** create training tools for companies looking to increase employees’ awareness of how sustainability impacts business value and find ways for employees to enhance sustainability efforts.

See the [Environment section](#) for information on how we’re engaging with renewable energy companies to create electricity **from hog manure and processing wastewater**.

Smithfield Association Membership

Our engagement with diverse stakeholders is reflected in the list of organizations in which we hold memberships.

National Organizations

- American Meat Science Association (AMSA)
- American-Romanian Business Council
- American Polish Business Council
- American Society for Microbiology (ASM)
- Animal Agriculture Alliance
- Center for Food Integrity
- Corporate Environmental Enforcement Council
- Democratic Attorneys General Association

State and Regional Organizations

- Alliance for the Chesapeake Bay
- Bladen County Committee of 100 (North Carolina)
- Bladen County Livestock Association (North Carolina)
- Cape Fear River Assembly (North Carolina)
- Clinton 100 Committee (North Carolina)
- Duplin Agribusiness Council (North Carolina)
- Missouri Agribusiness Association (MO-AG)
- North Carolina Chamber of Commerce

- Democratic Governors Association
- Environmental Law Institute
- EPA (U.S. Environmental Protection Agency) Office Water Stakeholder Meeting Agriculture/Manufacturing
- Food Marketing Institute
- Food and Beverage Environmental Conference
- Global Environmental Management Initiative
- Institute of Food Technologists
- International Association for Food Protection (IAFP)
- McDonald's Corp. Sustainability Council
- National Agriculture in the Classroom (NAITCO)
- National Association of Manufacturers
- National Farm Ranch & Rural Communities Committee (U.S. Environmental Protection Agency Federal Advisory Committee)
- National Pork Board (NPB)
- National Pork Producers Council (NPPC)
- National Renderers Association
- North American Meat Institute (NAMI)
- Organization for International Investment
- Republican Attorneys General Association
- Republican Governors Association
- U.S. – China Agriculture and Food Partnership
- U.S. – China Business Council
- U.S. – Poland Business Council
- U.S. Meat Export Federation (USMEF)
- Washington Agribusiness Council
- North Carolina Farm Families
- North Carolina Foundation for Soil and Water Conservation
- North Carolina Meat Processors Association
- Palmetto Agribusiness Council (South Carolina)
- Sampson County Friends of Agriculture (North Carolina)
- Various state pork associations
- Virginia Agribusiness Council
- Virginia Business Council
- Virginia Chamber of Commerce
- VA Department of Health – Water Advisory Committee
- Virginia FREE
- VIRGINIAforever
- The Virginia Public Access Project (VPAP)
- Wallace Committee of 100 (North Carolina)

These lists are not meant to be exhaustive and may not include every association of which we are members.

Public Policy

We participate in legislative and regulatory processes both as an individual company and through industry associations.

We believe that engagement in the political process is important in making our views heard on issues of significance to the business. Smithfield has participated in many cross-industry boards and commissions at the national and state levels.

The following are among the most significant current public policy issues for our company and industry:

- **Trade Policy.** Smithfield and the pork industry depend on free and open export markets to support our growing business. We are an American manufacturer, producing value-added food products that depend upon exports. Because of trade, we are an economic success story: U.S. exports of pork have increased by 1,550 percent in value and nearly 1,300 percent in volume since 1989, the year the United States started opening international markets for value-added agriculture products. Today, of the 150 million pigs produced each year in the United States, one out of every four is exported. These same pigs are huge consumers of American corn and soybeans. For us, trade creates more manufacturing and agriculture jobs in the United States.
- **Renewable Fuel Standard (RFS) Reform.** RFS, which requires huge volumes of corn to be processed into ethanol at ever-increasing volumes irrespective of market conditions, is a law we have worked for years to reform. The RFS diverts 40 percent of the nation's corn supply into fuel, artificially driving up demand, reducing supply, and increasing the cost of food. Our work has resulted in growing awareness of the drawbacks of the RFS and the steady erosion of public support. 2014 marked the first time that a majority of the U.S. House of Representatives (218 members) was on the record in support of reforming the RFS. Smithfield supports the passage of H.R. 704, the "RFS Reform Act of 2015," in the U.S. House of Representatives and S. 577, the "Corn Ethanol Mandate Elimination Act of 2015" in the U.S. Senate. These bills would eliminate the federal mandate for corn ethanol while keeping in place incentives for the development and commercialization of advanced ethanol.
- **Immigration.** Since many valued employees are legal immigrants, we pay close attention to debates on immigration reform. This immigrant workforce brings a rich diversity to our operations and the communities in which we live. We support comprehensive U.S. immigration reform that ensures we can maintain an adequate and stable workforce and provide opportunities for legitimate workers who seek employment at companies like ours. We believe the United States should protect legal immigrants and their employers.

Policies & Disclosures

California Slavery and Human Trafficking Disclosure

Smithfield¹ is committed to the protection and advancement of human rights, as enshrined in the Universal Declaration of Human Rights (UDHR) issued by the General Assembly of the United Nations on December 10, 1948. Smithfield and its employees adhere to the Smithfield Human Rights Policy (our "Policy"), which is grounded in the [Smithfield Code of Business Conduct and Ethics \(PDF\)](#) (our "Code of Conduct"). A primary tenet of our Policy is "Smithfield does not use forced or compulsory labor."

Effective January 1, 2012, the California Transparency in Supply Chains Act of 2010 requires Smithfield to make the following disclosure as to our efforts to eradicate slavery and human trafficking from our direct supply chain:

- **Verification of Supply Chain.** Smithfield has been preparing a code of conduct for our suppliers (our "Supplier Code"). A primary tenet of that code will be adherence to all relevant laws and regulations, including those addressing slavery and human trafficking. We will update this disclosure once our supplier code of conduct is in effect.
- **Audit.** Smithfield does not currently conduct audits of suppliers to evaluate supplier compliance with company standards against trafficking and slavery in supply chains.
- **Supplier Certification.** Once our Supplier Code is in effect, our suppliers will be required to certify compliance with our Supplier Code.
- **Accountability.** Smithfield is committed to ethical and socially responsible conduct in the workplace. Upon hire, Smithfield requires all employees to read and acknowledge receipt and understanding of our Code of Conduct. Employees recertify this acknowledgment annually. Our Code of Conduct includes, among other things, certification that the employee will comply with all applicable laws and regulations. Human trafficking and slavery is a violation of such laws, and would constitute a violation of our Code of Conduct. Such a violation could result in disciplinary action against the employee, including termination.
- **Training.** As noted above, Smithfield requires annual certification from our employees that they understand and will adhere to our Code of Conduct. We do not conduct specific training at this time on our Code of Conduct or on our Policy.

Supplier Code of Conduct

Smithfield¹ continues to focus on its vision of being the most trusted, respected, and ethical food industry leader. This vision supports our promise to customers that we will produce "Good food. Responsibly.®" Our suppliers are integral to maintaining and improving on these goals by providing sustainable products and services. This Supplier Code of Conduct has been implemented to help ensure that our suppliers continue to meet and exceed these high standards.

It sets forth the business conduct requirements for all suppliers (suppliers, vendors, contractors, and consultants) who do business with Smithfield as well as strategies to support a sustainable future. These requirements are in addition to other contract terms and conditions that apply. The degree to which suppliers comply with these applicable requirements and the extent of their sustainability efforts will be considerations for future business with Smithfield.

Legal Compliance

Suppliers must comply with all applicable laws, regulations, and rules for the products and services they manufacture, distribute, or otherwise provide. This includes compliance with federal, state, local, and international requirements. Examples include, but are not limited to, the following areas:

- Environmental
- Health and Safety
- Labor/Employment

- Labeling/Packaging
- Transportation
- Record Keeping and Accounting
- Securities/Insider Trading
- Import/Export
- Antitrust/Fair Competition
- Foreign Corrupt Practices
- Data/Copyright
- Immigration

Labor and Human Rights

Suppliers shall treat all employees with respect and dignity at all times. Adherence to laws and regulations governing labor and human rights is a prerequisite for this to occur. Smithfield recommends suppliers go beyond the legal requirements and implement policies and procedures that help foster improved employee relations.

Forced Labor

All labor used by suppliers must be voluntary. The use of forced labor of any kind is prohibited, including indentured service, involuntary prison labor, bonded labor, and labor performed due to physical threat.

Child Labor

Suppliers and their subcontractors shall not use child labor as defined by federal and state regulations and international standards. Smithfield prefers suppliers do not employ anyone under the age of 16.

Working Hours

Suppliers shall not schedule employees to work more hours or days than allowed by applicable laws. Voluntary alternative schedules and overtime are acceptable if conducted in compliance with legal requirements and collective bargaining agreements.

Compensation

Employees shall be fairly compensated for their work, which must meet minimum wage requirements where applicable. Wages should be comparable to those of similar companies in the local area. Overtime shall be paid as required by law or at least the same as the hourly wage.

Freedom of Association/Collective Bargaining

Suppliers must respect the rights of employees to freely associate, organize, and bargain collectively.

Harassment and Abuse

Suppliers must ensure that their facilities are free from employee harassment, threats, punishment, or other forms of abuse.

Product Safety and Quality

Smithfield is dedicated to providing the highest-quality meats and packaged foods to our customers. Suppliers of meat products and ingredients have a direct impact on our ability to meet this commitment and, therefore, must have in place policies and procedures to manage the safety and quality of products delivered to us. Smithfield reserves the right to inspect supplier facilities and request documentation to verify that these

systems are in place and are being fully implemented.

Animal Well-Being

Smithfield is committed to being the industry leader in animal care practices to assure respectful and humane treatment of animals that we own or process, to produce wholesome food products for our customers, and to analyze our operations and practices, including internal and third-party audits, to ensure continual improvement. Suppliers that provide animal products to our facilities are expected to have similar operating policies and procedures in place to ensure the humane treatment of their animals during all stages of production, transportation, and processing. We invite our suppliers to review our Animal Care Policy and Antibiotics Policy for further guidance.

Environment and Sustainability

At Smithfield, we are constantly striving to improve our environmental performance and we aim for leadership in our industry. Our suppliers must be an extension of these environmental stewardship efforts by adhering to applicable environmental regulations as a minimum. In addition, Smithfield expects its suppliers to pursue environmentally responsible leadership roles by proactively reducing its environmental impact and assisting our facilities in meeting their environmental objectives and targets whenever possible. Suppliers should consider the following environmental management best practices and sustainability goals:

- Smithfield prefers that suppliers adopt an Environmental Policy and implement an environmental management system;
- Obtain all permits and develop all applicable environmental plans required for your facilities and fully comply with their monitoring, reporting, and renewal requirements;
- Minimize waste generation and manage all wastes as required by law and in a responsible manner. Source minimization practices are preferred followed by direct reuse and recycling of wastes where feasible;
- Minimize water use and wastewater generation through conservation practices and reuse options;
- Minimize air emissions that affect human health and the environment, and effectively operate installed air emission control processes;
- Reduce energy consumption and the generation of greenhouse gases;
- Reduce packaging materials for supplied products and assist Smithfield in reducing the environmental impact of the packaging used for our food products. A life-cycle approach to packaging design is preferred; and
- Reduce the use of hazardous materials in manufacturing operations and inform Smithfield of any formulation changes that could adversely impact our environmental performance or food quality.

Health and Safety

At Smithfield, the safety, health, and well-being of our employees is more important than our most valued customer. Our suppliers must also give the health and safety of their employees the same priority. Again, compliance with health and safety legal requirements is mandatory. The minimum program requirements include:

- Provide employees with clean, safe, and healthy working conditions;
- Provide potable drinking water, adequate sanitation facilities, resources to respond to fire and medical emergencies, and personal protective equipment;
- Implement policies and procedures that help ensure equipment is maintained in a safe condition, identify and correct workplace hazards, monitor and report on workplace illness and injury, require health and safety education and training for employees, and encourage employee participation; and
- Minimize employee exposure to health hazards including hazardous chemicals, biological agents, and air pollutants.

Business Integrity

Smithfield expects its suppliers to always conduct business with high ethical, legal, and socially responsible standards. The Smithfield Code of Business Conduct may be referenced for a more detailed discussion of our expectations.

Ethical Behavior

Suppliers must not tolerate any form of corruption within their company or from their subcontractors such as fraud, bribery, extortion, or embezzlement. The improper use of insider information and price fixing are prohibited.

Conflicts of Interest

Suppliers shall notify Smithfield of any potential conflict of interest relating to financial interests or other arrangements with our employees that may be considered inappropriate. Gifts and entertainment offered to employees must not be excessive or construed as an attempt to influence business decisions.

Protecting Company Assets

Suppliers often have access to company assets and sensitive information that must be safeguarded. This includes trade secrets, intellectual property, production methods and equipment, and financial information. Disclosure of confidential information or use of trademarks and copyrighted information requires written approval. Smithfield reserves the right to have executed nondisclosure agreements on file with distributors and manufacturers although this shall not prevent Smithfield from conducting general business transactions.

Verification of Supplier Compliance

Smithfield will verify compliance with this Code of Conduct through the following:

- Smithfield reserves the right to audit supplier facilities following a reasonable request, with the expectation that suppliers will correct identified deficiencies.
- Suppliers shall inform Smithfield of any significant regulatory noncompliances or significant news events that may negatively impact public or governmental views of our company or jeopardize our legal compliance.

Suppliers shall complete an annual sustainability assessment survey, if requested, to develop a baseline of sustainability performance and identify improvement trends.

Code of Business Conduct and Ethics

The Smithfield¹ Code of Business Conduct and Ethics embodies our commitment to doing the right thing in all aspects of our business. Doing the right thing means acting in the best interests of those who count on us to do our jobs: our customers, our co-workers, and the public.

All employees are asked to sign a statement that they have read and understand the Smithfield Code of Business Conduct and Ethics, and that they will act in full compliance.

The Code of Business Conduct and Ethics is available in the following languages:

[English PDF](#)

[Polish PDF](#)

[Romanian PDF](#)

[Spanish PDF](#)

¹ All references to "Smithfield," "we," "us," and "our" are terms of convenience used to refer collectively to Smithfield Foods and all of its subsidiaries. Similarly, the terms "division" and "business unit" may be used to refer to one or more subsidiaries, which are independent operating companies.



Our Commitment to Sustainability Abroad

While our market presence is well known in the United States, many domestic customers don't realize we have significant operations in Poland and Romania and that Smithfield products can be found in 44 countries worldwide.

Our Polish hog production segment is the largest in the country, producing more than 2 million market hogs per year. The segment also operates three poultry-growing farms and four hatcheries that provide chicks to approximately 540 independent growers; these growers, in turn, supply our poultry processing plants. Our Romanian pork processing plant is the country's largest and receives the majority of its market hogs from 46 company-owned farms. The segment also processes meat from 21 contract growers throughout the country.

Our international operations¹ adhere to Smithfield's U.S. corporate policies in our key sustainability areas and have developed their own specific performance goals and targets for advancing animal welfare, reducing environmental impacts, maintaining the highest standards of food safety and quality, helping those in need, and safeguarding employees.

Supporting Growth and Development in Europe

Smithfield has supported growth and modernization of the Polish and Romanian agriculture industry in several vital ways:

- Providing unique opportunities in grain and feed production, livestock farming, meat production, and product marketing;
- Making sizeable investments in infrastructure and helping our suppliers modernize;
- Sharing of vast industry knowledge; and

- Expanding market presence by acquiring respected and recognizable brands.

Celebrating 17 Years in Poland

- 1951: Animex founded by the Polish government.
- 1960: Animex buys the KRAKUS trademark.
- 1990: Animex becomes a private company, purchasing several meat and poultry plants, agricultural companies, and feed factories.
- 1994: Animex listed on the Warsaw Stock Exchange.
- 1999: Smithfield Foods becomes Animex's majority shareholder.
- 2000: Smithfield Foods expands Animex's hog production and feed factories in Poland to create the Agri Plus group of companies.
- 2002: Smithfield Foods becomes owner of 99 percent of Animex's shares and discontinues public trading.
- 2004: Animex acquires Zakłady Miesne Morliny (and its brands Morliny and Berliniki).
- 2007: The Animex Foundation (now part of the Smithfield Foundation) is created.
- 2013: The WH Group purchases Smithfield Foods.

Celebrating 13 Years in Romania

- 1967: Comtim Company is founded and will soon become the largest pork producer in Romania.
- 1980: Comtim Company begins shipping products throughout Europe.
- 1998: Comtim Company reorganizes and, in 2002, becomes the Comtim Group.
- 2004: Smithfield Foods buys Comtim Group.
- 2007–08: Smithfield begins to modernize and expand production facilities, farms, and feed mills. First contract grower farms become operational.
- 2012: Smithfield Romania becomes the first European Union (EU) Meat Export Authorized Romanian meat producer.
- 2013: The WH Group purchases Smithfield Foods.
- 2015: Smithfield Romania becomes the first Romanian producer to export to China.

¹ "International operations" refer to wholly owned Polish and Romanian operations specified in this section.

Value Creation

Our international operations demonstrate that cooperation between Eastern European and U.S. professionals can bring substantial value to local agricultural, animal husbandry, and food production industries.

The international operations are among the largest agricultural and food processing companies in Poland and Romania. In 2016 we contracted with more than 1,000 Polish nurseries and finishing farms—to the tune of \$50 million¹—to supply virtually all of the hogs sold by our hog production operations. Our Polish processing operations have hog supplier contracts worth \$155 million and purchased an additional \$85 million of hogs on the open market from independent farmers. In total, the Polish operations contribute \$290 million into the Polish economy each year in hog purchases alone. Our Romanian operations added two dozen new contract farmers in 2016. These agreements provide multiple economic benefits to rural communities, including employment, steady income, and modernized agriculture.

We also infuse hundreds of millions of dollars each year into small businesses and the regional economy by purchasing only locally grown grains to feed our pigs. In 2016, we paid local farmers nearly \$135 million. Buying local grains also reduces transportation demand, leading to fewer miles driven, less fuel consumed, lower emissions, and a smaller carbon footprint.

Supporting Local Grain Farmers	Romania	Poland
Number of suppliers	158	580
Local spending	\$43.5 million	\$91.1 million
Annual crop purchases (tons)	307,300	747,400

All values for 2016.

But it isn't just about buying raw materials and market hogs. We also want to help our partners' businesses thrive, which will ultimately reap benefits for our own business. To achieve this, we leverage our company's size and vertically integrated business model to assist local hog and grain farmers in developing their facilities and improving production. We provide useful advice to our suppliers, helping them design crop production schedules, diversify their earnings, modernize their farms, and secure loans to expand vital infrastructure.

We encourage local farmers to build modern hog production facilities. In Poland, our local suppliers have invested nearly \$54 million to erect 121 buildings and upgrade an additional 132 buildings since 2013. In Romania, our contract growers recently built seven contract wean-to-finish farms, which produce market hogs for processing operations.

In 2016, the international operations invested nearly \$7 million in new growth opportunities. In Romania, several of our company-owned farms underwent a \$2.9 million improvement project, increasing the number of sows we can raise each year. Our Romanian operations also established relationships with 15 new contract growers. Our Polish hog production segment built a large crop warehouse for its feed mill in the town of Szamatuly. The \$3.2 million facility increased warehouse capacity by 23,000 tons.

¹ All financial figures throughout this International Operations section are in U.S. dollars.

Animal Care

We take seriously our responsibility to raise our pigs in a healthy, safe, and comfortable manner and take the steps necessary to ensure we are at the forefront of Europe's hog production industry.

Neglect or abuse of animals in any form is not tolerated and is grounds for employee or contract grower termination. Offenders may also be subject to criminal prosecution under applicable local laws.

The European Union has adopted specific rules and regulations for the welfare of pigs and poultry on farms, during transport, and at processing facilities. European operations are regularly audited to ensure compliance.

Animal Care Policy

All European operations maintain a formal [Animal Care Policy](#) that is consistent with Smithfield's U.S. operations.

Our Animal Care Goal

- Keep animals safe, comfortable, and healthy

Our Animal Care Targets

- Provide group housing for pregnant sows and housing for laying hens per European Union (EU) requirements
- Provide pigs and poultry with the floor area and surface required by the EU
- Train relevant farm and plant employees in animal handling procedures
- Implement a written program for animal welfare at plants

Developing Animal Care Professionals

In Romania, the animal production department maintains an internal certification program for its animal caretakers, veterinarians, and technicians. The curriculum consists of several three-month classes covering theoretical and practical elements for each area of hog production, from gestation through finishing. Employees must pass one certification level to advance to the next.

The career development program, which offers opportunities for advancement within the company, is designed to better prepare employees, improve farm performance, and identify potential department managers. In 2016, 42 percent of eligible animal care professionals completed our internal certification program—up from 34 percent in 2015.

In Poland, the veterinary group employs more than 100 veterinarians and animal care technicians. We provide professional development guidance and financial support to the most promising among them to pursue post-graduate specialist studies. Each year, we send up to 40 animal care professionals to conferences or training sessions to learn the best practices in pig production.

Animal Handling

Every new employee receives animal care training upon hire and is certified by local agencies. All processing plant employees who work with live animals are also trained and supervised by state veterinarians. Each fresh pork plant has at least one designated animal welfare specialist responsible for animal care. These individuals undergo specialized training and report directly to the facility's managing director. Government veterinary authorities provide ongoing training and support.

Our animal handling protocols include the following elements:

- Comprehensive document controls to ensure traceability;
- Rigorous biosecurity protocols;
- Proper hygiene measures; and
- Humane euthanasia.

European pork operations use a slaughter procedure known as carbon dioxide (CO₂) anesthetizing, which stuns animals. Poultry slaughter operations use an electrical water-stunning process.

Audits

Government veterinarians work with local animal care and food safety authorities to regularly inspect the farms that raise our hogs and the plants that process our products. These external audits verify compliance with national animal care laws and biosecurity measures to reduce the risk of diseases. Further random inspections also take place throughout the year.

Specially trained internal auditors conduct twice-yearly audits of farming operations to verify compliance with animal care procedures, biosecurity and traceability, employee training programs, and transportation systems. Nonconformance is addressed with swift corrective action, and we give support and technical assistance to help each facility with compliance.

In 2016, there were no penalties for animal welfare noncompliance at Smithfield's European farms or processing plants.

Animal Housing

Housing Pregnant Sows

A European Union (EU) ban on individual stalls for pregnant sows came into effect in 2013. Our company-owned farms and contract sow farms in Poland and Romania meet the requirements, which prohibit individual stalls during all but four weeks of the gestation period, and all applicable local regulations. Processing facilities only source pigs from farms that meet the sow housing requirements. We communicate this to suppliers and regularly monitor their performance.

In 2016, our Romanian operations completed a two-year sow housing expansion and renovation project using state-of-the-art technology design and production equipment to build three new barns and modernize eight others. In addition to infrastructure updates, the project streamlined production flow and established new partnerships with Romanian contract growers. These improvements increased housing capacity by 12 percent, reaching a total of 52,000 sows.

Housing Poultry

In Poland, we operate egg-laying farms and hatcheries to supply chicks to independent poultry producers. These poultry-growing farms use non-cage housing according to EU and Polish animal welfare requirements.

Antibiotics Use

The European Union banned feeding antibiotics and related drugs to livestock for growth promotion purposes more than 10 years ago. All company-owned and contract farms in Poland and Romania follow these strict guidelines and comply with all antibiotic withdrawal timelines.

Antibiotics are only given when animals are sick, injured, vulnerable, or exposed to illnesses. Our international operations only use water-based and injected antibiotics to treat individual hogs or poultry. Authorized veterinarians supervise antibiotics usage on company-owned and contract farms, monitoring them weekly. The antibiotics administration process is overseen and controlled by each country's respective regulatory agencies.

We track and report antibiotics administration based on the total active ingredient given to the pigs via water-soluble and injected products. In 2016, the total was 128.7 milligrams per pound.

Antibiotic-Free Hogs

In late 2015, the Polish hog production group began raising a limited number of antibiotic-free hogs in response to increased consumer demand for meats raised without antibiotics, as well as new European animal health legislation designed to minimize antibiotics use. Each antibiotic-free piglet gets a green ear tag at birth to inform workers that it should not receive any water-based or injected antibiotics. However, if the pig becomes ill, we administer injectable antibiotics under the supervision of a veterinarian. That pig then loses its "antibiotic-free" status (along with its green ear tag) and rejoins the general population. Hogs that complete growth at the finishing farms with their "antibiotic-free" status intact are sold separately and are identified prior to slaughter. To date, we have raised more than 65,000 antibiotic-free hogs.

In early 2017, our antibiotics specialists began training our hog and poultry suppliers in antibiotic-free procurement and farming practices and conducting regular audits at their facilities.

Safe Transportation

Our operations maintain live-haul accident-response procedures consistent with our domestic operations and also conduct extensive training for all employees who work in processing, security, and transportation. In 2016, our European operations had six accidents involving hogs carried from company-owned and contract farms.

Market Hog Transportation Accidents	2012	2013	2014	2015	2016
Number of accidents	1	0	6	0	6
Market hogs involved	460	0	874	0	1,072
Market hog transportation fatalities	87	0	76	0	160

Data for 2012 and 2013 are reported by fiscal year (May 1–April 30). Data for 2014 and after are reported by calendar year.

Environment

Employees at our European farms and processing plants are committed to producing more fresh and packaged meats while minimizing the use of resources and creating less waste.

We recently adjusted the way we track production volumes at our facilities to more accurately account for the amount of finished products being shipped out of the plants. Because this increased production totals, all four of our key normalized metrics show improvement (especially greenhouse gas [GHG] emissions and material to landfill), even though our facilities did not significantly reduce their resource use. We also updated our methodology for estimating our GHG footprint.

For more information, please view our [Environmental Performance page](#).

Our Environmental Goals

- Reduce natural resource demand
- Eliminate notices of violation (NOVs)
- 100% compliance, 100% of the time

Our Environmental Targets and Progress

2020 Reduction Target
(based on 2014 baseline)

Progress
(as of December 31, 2016)

Our Environmental Targets and Progress	2020 Reduction Target (based on 2014 baseline)	Progress (as of December 31, 2016)
Greenhouse gas (GHG) intensity	↓ 5%	↓ -10.1%
Energy intensity	↓ 5%	↓ -8.3%
Water intensity	↓ 10%	↓ -7.2%
Normalized material to landfill	↓ 10%	↓ -23.8%

All targets and reduction figures are normalized by production levels.

All hog farms, feed mills, and processing plants in Europe are ISO 14001 certified. European facilities seek to reduce the environmental impacts identified by our environmental management systems through innovative programs. At processing plants, managers track each project and keep senior management informed of progress. Most European facilities enter these projects for [Smithfield's Environmental Excellence Awards](#).

Some recent efforts to improve efficiency and reduce our environmental footprint include the following:

- Our processing plant in Timisoara, Romania, underwent a project to improve the performance and energy efficiency of its hot water and steam boiler system, replacing a decade-old burner with a new generation model that uses 5 percent less natural gas per ton of steam. It also added a heat regenerator to the system, which helps the boiler run more efficiently while improving local air quality, as well as a filtering system that purifies incoming water via reverse osmosis and further improves efficiency. Together, these improvements are saving the plant more than \$61,350 a year in energy costs.

- Two processing plants in Morliny and Opole, Poland, recently upgraded their air handling and water heating systems. Because these efforts saved significant amounts of energy, the Polish Energy Regulatory Authority granted these facilities Energy Savings Certificates, which certify that a certain amount of energy reduction has been met. Similar to carbon credits, each certificate is a unique and traceable commodity that can be traded to other energy consumers to help them meet individual energy reduction targets. The combined value of these certificates is \$117,100.
- The feed mill in Zamosc, Poland, installed an advanced boiler system that utilizes reverse osmosis to reuse water that had been previously lost in steam production. As a result, the boilers use 15 percent less gas.
- Our processing plant in Romania installed advanced water meters designed to deliver instantaneous water use data to a centralized platform. This allows real-time analysis of water use and can help identify water treatment equipment failures, pushing the plant toward meeting its water reduction targets.
- The processing plant in Szczecin, Poland, began sending its wastewater sludge to a local biogas plant. This generates energy and saves the plant \$105,000 per year.
- Our farming operations in Romania used to send 100 percent of their glass medical waste to a local incinerator, which was costly and wasted highly recyclable material. Between 2014 and 2015, we analyzed our glass handling practices and collaborated with a local recycler to recycle nearly 70 percent of all outgoing glass. Since its inception, the glass recycling effort has saved our farms \$32,500.
- The processing plant in Suwalki, Poland, installed four new cooling systems for its ammonia compressor units. The upgrade saves the facility 33,000 kilowatt hours and 20,000 cubic meters of natural gas per month.

Manure Management

Our hog production operations have dedicated environmental and manure management staff at the supervisory and field technician levels. The former coordinate permitting and compliance activities; the latter develop and implement nutrient management plans. This approach is designed to protect local water sources and effectively utilize a potentially valuable resource.

Most facilities either use storage tanks or combine manure with straw bedding before fertilizing crops, while the remaining farms use storage lagoons. Treatments and storage processes vary, depending on the facility.

Every year, we fertilize tens of thousands of acres of cropland with organic fertilizer, using the safest and most modern technologies. Manure as an organic fertilizer provides nutrients and promotes soil health while also providing financial benefits to local farmers. Each European farm uses a comprehensive nutrient management plan when applying manure as organic fertilizer to local farmland. These plans must identify available land, include agrochemical and pedological studies, inform regulators of the nutrient content of the fertilizer, and evaluate the potential impacts that land application may have on local water bodies. In Poland, each plan is approved by local authorities. In Romania, the local authorities prepare detailed plans, which include crop descriptions and projected yields, soil and manure test information, and rates of application to balance with the crops' fertilization needs. Each of our Romanian farming operations must also maintain Integrated Pollution Prevention and Control permits, which require strict application practices, groundwater monitoring, and soil quality analyses throughout the year.

Producing Renewable Energy

Polish farming operations have manure supply agreements with biogas project developers who designed, financed, and constructed three biogas plants located in villages near our locations. These plants produce approximately 9.2 megawatts of electricity and heat energy annually.

Environmental Performance Summary

Data Collection and Management

This section provides performance highlights toward all of our environmental targets and commitments in Romania and Poland. We report some metrics in absolute terms; others are normalized by 100 pounds of product (cwt). The 2014 and 2015 normalized figures for greenhouse gas (GHG) emissions, energy, water, and solid waste have been restated as a result of improved tracking of production volumes at our facilities. Recent changes we made to our GHG emissions calculations also impacted GHG and energy metrics for prior years. See the [GRI Content Index](#) for more information

on our methodology.

Greenhouse Gas (GHG) Intensity

(metric tons CO₂e/cwt)
14–16 Change: -10.1%



CO₂e stands for carbon dioxide equivalent. CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Direct and Indirect GHG Emissions	2014	2015	2016	14-16 Change
Carbon dioxide (CO ₂) emissions (metric tons)	227,067	235,131	247,860	
Methane (CH ₄) emissions (metric tons CO ₂ e)	196	211	212	
Nitrous oxide (N ₂ O) emissions (metric tons CO ₂ e)	337	276	289	
Total GHG Emissions (metric tons CO₂e)	227,600	235,618	248,361	9.1%

CO₂e stands for carbon dioxide equivalent. CWT equals 100 pounds of product. GHG emissions do not include farming operations. As a result of updated GHG calculation methodology, we have restated 2014 and 2015 figures. Smithfield reports GHG emissions using [The Greenhouse Gas Protocol Initiative](#) developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Publicly available emissions figures are used where no reliable data are available from energy providers. We report on scope 1 emissions (direct) and scope 2 emissions, which include indirect emissions associated with the use of purchased electricity and steam.

Energy Intensity

(gigajoules/cwt)
14–16 Change: -8.3%



CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Direct and Indirect Energy Use by Fuel Type (gigajoules in millions)	2014	2015	2016	14-16 Change
Natural gas	0.87	0.91	0.99	
Propane	0.23	0.25	0.29	
No. 2 oil (includes transportation diesel)	0.09	0.10	0.11	
Coal	0.58	0.55	0.55	
Total Direct Energy Use	1.77	1.81	1.94	9.6%
Electricity	0.85	0.90	0.98	
Steam	0.01	0.01	0.02	
Total Indirect Energy Use	0.86	0.91	0.99	15.5%
Total Energy Use	2.63	2.72	2.93	11.5%

Water Intensity

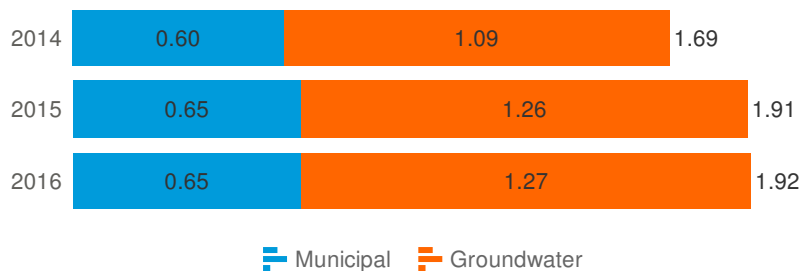
(gallons/cwt)
14–16 Change: -7.2%



CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Water Use by Source

(billions of gallons)
Total Change: 13.6%



Reported volumes may have also been affected by improved data recording at our Romanian hog production operations.

Normalized Material to Landfill

(pounds/cwt)
14–16 Change: -23.8%



CWT equals 100 pounds of product. As a result of improved reporting practices, we have restated 2014 and 2015 figures.

Solid Waste to Landfill

(pounds in millions)
14–16 Change: -6.9%



Compliance

In 2016, our Polish operations were assessed seven environmental notices of violation (NOVs) and \$120 in penalties. Our Romanian operations received zero NOVs. While the number of NOVs has remained steady over the past four years, those we have received relate to recordkeeping issues that do not impact surrounding communities; as a result, the dollar amount of penalties imposed has been declining.

Compliance	2013	2014	2015	2016
Notices of violation (NOVs)	8	5	6	7
Fines (\$U.S.)	\$2,030	\$6,155	\$750	\$120

We take any NOV or fine seriously and work quickly to determine how our management systems can be improved while we are making corrective actions. We also work with regulators to resolve all environmental issues as they arise.

Food Safety & Quality

Our international operations work with industry, government, and independent experts to provide safe and delicious foods that meet increasingly robust regulatory requirements and customers' evolving expectations. We focus on innovation and empower employees to contribute to process improvements so we can deliver the highest quality products for our customers.

Our Food Safety & Quality Goals

- Deliver safe, high-quality meat products
- 100% compliance, 100% of the time

Our Food Safety & Quality Targets

- Maintain Global Food Safety Initiative (GFSI) certification at all applicable facilities
- Assure a wide variety for different diets and needs, and include products designed to address health and wellness in accordance with accepted standards

We have rigorous food safety practices in all facilities, manufacturing processes, and distribution networks. Each facility maintains all applicable certifications to international and federal food safety standards (e.g., ISO 22000, British Retail Consortium, and International Featured Standards) and is subject to routine—and often unannounced—third-party audits. We also inform consumers about nutrition and safe food handling through our product labels and additional outreach efforts.

Smithfield's international food safety systems are reviewed and validated annually by qualified third parties. All applicable facilities are GFSI-certified.

Training

Our employees undergo extensive training in food safety policies and procedures—tailored to each location—to keep food safe. Each worker is trained on various aspects of our Quality Management Systems procedures upon hiring and is retrained on a regular basis, depending on his or her job requirements.

In order to foster continuous improvement in food safety and quality, the food safety teams constantly look for new ways to incorporate emerging food safety innovations into products and processes. The teams also regularly present scientific papers at national conferences and attend educational seminars, professional meetings, and regulatory meetings. They use the latest techniques they've learned to train other employees.

Nutrition

Our European operations offer dozens of fresh meats and packaged food products that offer health and wellness benefits and satisfy a wide assortment of consumer needs and tastes while meeting all European Union nutrition and labeling standards. Some of our latest offerings include the following:



- Morliny Berlinki turkey hot dogs are leaner and have fewer calories than traditional pork hot dogs.
- Morliny's new line of hot dogs is certified free of gluten, phosphates, and glutamine.
- Krakus' roasted paté is gluten-free and contains no sorbates or artificial flavors.
- Krakus introduced a line of preservative-free hams in response to customer demand for traditional Polish deli meat.

Our Romanian operations have historically only produced fresh meat, which is not processed with sodium or other additives. They recently started to produce a range of semi-processed products (such as fresh sausages and minced meat).

Compliance

In 2016, the Polish processing operations were assessed 10 violations totaling about \$2,000 due to labeling issues. No other significant penalties or fines associated with food safety were assessed. When violations are assessed, we work quickly to address any issues identified and to find ways to improve our systems and, therefore, decrease the potential for future violations.

Helping Communities

Our European operations are committed to being good neighbors in places where large agricultural companies are often misunderstood.

As part of our efforts to form better relationships with our stakeholders, we work closely with local authorities and community leaders to provide a wide range of programs that are important to the people who live near our operations and that contribute to local economic development. We have a long history of organizing events and making sizeable donations that benefit our neighbors, friends, and families. We are proud of the impact we can make in peoples' lives. But employees are the real driving force. In 2016, European employees volunteered nearly 2,200 hours of their time to support local beautification efforts, raise money to help underprivileged students attend school, and host local cultural festivals.

For their social responsibility efforts throughout the country, our Romanian operations received the 2016 Award of Excellence in Social Responsibility from the Timiș Chamber of Commerce and Industry.

Our Community Goal

- Provide food to those in need and enhance education in our communities

Our Community Targets

- Provide food-related assistance (food or funding) to those in need
- Interact with schools or students to provide help with supplies, facilities, or scholarship assistance
- Each facility/farm division to participate in two events involving agricultural education for local students
- Each facility/farm division to participate in at least one community cleanup day

We prioritize funding hunger relief efforts, education for local students, and environmental outreach. We also support cultural awareness programs that honor the rich heritages of the communities in which we operate.

Donations	2016
Cash (\$U.S.)	\$166,643
Food (cash value)	\$126,571
Food (servings)	146,878
Total value (\$U.S.)	\$293,214

Food donations are valued at production cost of the donated meat and finished product. Other donations (e.g., school supplies) are valued at cost.

Hunger Relief

As a food company, we believe it's important to provide much-needed sources of protein to individuals in need. Some of our recent efforts include the following:

- Our "Food for Souls" program has provided fresh meats and hot meals to disadvantaged citizens near Timisoara, Romania, through more than 30 local partner organizations for nearly a decade. In 2016, the Romanian operations provided more than 32,100 pounds (128,400 servings) of meat and protein products to daycare centers, hospitals, orphanages, and other locations.
 - In Poland in 2016, our processing plants delivered nearly 73,600 pounds (294,400 servings) of food products to local people in need.
 - Polish operations donated over \$68,800 to provide food to children in need through local schools.
-

Education

Our European operations support early education: helping students attend school, funding rural libraries, providing school supplies, and celebrating academic achievements in our local communities.

For the last decade, our Romanian operations have supported more than 37,400 students in 63 local villages through the "Back to School" program, which provides essential supplies to preschool and primary school children. In total, our volunteers spent more than 1,000 hours and traveled 4,350 miles to provide students with 30,000 backpacks, sets of school supplies, and sports equipment for the school year. In 2016, 300 volunteers visited 6,600 students at 55 schools throughout Romania.

We also support "Smithfield Academics," a collaboration with local universities and high schools designed to prepare future specialists in our industry (e.g., animal husbandry, food processing, veterinary sciences) through internship programs, conferences, seminars and field trips to our facilities. Sixty local students held internships at our locations in 2016.

Our Polish operations created the [Zygmunt Piwoński Smithfield Polska Foundation](#) to support the education of young people in the regions where we operate by awarding academic scholarships. Each fall, we encourage the children of our employees, suppliers, and contractors to apply by posting applications online. Our hope is that some of them will work with us after finishing their studies. In 2016, we gave about \$213,100 for 393 scholarships for children of employees and farmers from rural areas. Since its inception 10 years ago, the Foundation has granted 1,648 scholarships worth \$884,700.

Environmental and Community Outreach

We embrace our responsibility to advance environmental stewardship where we operate, from beautification and cleanup projects, to tree planting, to support of World Water Monitoring Day. We also work with local organizations focused on the health and wellness of our neighbors in need.



Smithfield Romania employees and their families participate in the 2016 "Green Day."

Every spring, our Romanian operations take time to revitalize the green space near our facilities. Each daylong event fosters interaction among employees who might not otherwise get to know one another and culminates with a family barbecue, complete with face painting, games, and other activities for children. In 2016, over 200 volunteers—including our employees and their families and friends—participated.

We also prioritize community outreach. Romania, for example, is culturally diverse, with traditions observed by communities originating from Romania, Bulgaria, Germany, Hungary, and Serbia. Smithfield is proud to support a variety of traditional festivals, including concerts, dance contests, craftsmanship fairs, and sporting events, such as horse cart racing. We also participate in several programs that help local families in need, improve children's health services, and honor the rich heritages of the communities in which we operate. In 2016, Smithfield Romania supported Fundatia Polyclinici Sociale Regina Maria, a nongovernmental organization that provides free healthcare, including cancer screenings and dental services, as well as support groups and education, to thousands of disadvantaged Romanians.

People

Our international segment is one of the largest employers in its communities of operation, offering good jobs in rural parts of Poland and Romania with high unemployment rates. But our operations are more than just a paycheck for many of our employees. We also offer new opportunities to grow professionally. Our operations are successful because our people work as a team and come up with innovative solutions to any challenges that we face.

In 2016, European employees were almost uniformly nationals. Of approximately 11,340¹ employees, nearly half were women.

European Workforce by Age and Gender	Female	Male	Under 30	30-50	Over 50	Total
Number of full-time employees	5,508	5,832	2,235	6,162	2,943	11,340 ¹
Percentage of employees	48.6%	51.4%	19.7%	54.3%	26.0%	

Employee Development

In order to attract the best local talent, our farming operations in Europe utilize centralized job posting programs, giving mid-level managers the ability to apply for positions of interest in any location. Removing perceived geographic barriers to employment has resulted in hires that improve the performance of several locations.

We also develop long-term educational projects with local agricultural universities to help promising students who may be interested in careers both in our European and U.S. facilities. For nearly a decade, the Romanian farming group has worked with Banat University of Agricultural Sciences and Veterinary Medicine to offer a six-week internship program to help students gain knowledge and real-world experience related to large-scale animal agriculture. Through this program, we send several veterinary students to our farms in the United States to learn more about modern production practices.

Our Polish operations have relationships with several life science and agricultural universities to enhance students' academic experience and to provide employment opportunities. Not only do our farms hire well-trained employees, but they also benefit from access to the universities' laboratories and scientific expertise.

Our Polish food processing segment maintains a robust internship available to more than 50 interns from nearly two dozen local secondary schools each year. In 2016, we opened a training facility in Opole, Poland, to develop skilled instructors and give local students vocational education that can help prepare them for jobs at our company.

We want to make sure that the employees we hire stay with us and grow professionally. By focusing on in-depth training, career development, and succession planning, we can boost employee retention while cultivating a more highly qualified and satisfied workforce.

For example, our Romanian hog production and feed departments offer employees professional development opportunities through internal certification programs. These multi-year programs include 30 hours of theoretical training and 50 hours of practical training designed to address a wide variety of topics tailored to each employee's area of expertise. To date, hundreds of employees have participated. In 2016, 380 production employees completed certification programs. Since 2015, Smithfield Romania has offered regular training workshops designed to give our managers the skills and experience they will need to facilitate the transition to "One Smithfield."

Also in Romania, we came up with a fun way to incentivize engagement and encourage our veterinarians to stay current with the latest in animal care

training; taking a multiple-choice test at our monthly meetings. Those with the top three scores receive prizes. In 2016, we held six such contests. Following the test, participants discuss recent advancements in veterinary procedures and other veterinarian topics. In addition to these friendly contests, our veterinarians are strongly encouraged to attend industry related workshops, seminars, and conferences to continue their professional growth and develop relationships with other professionals in their field.

In Poland, meanwhile, our operations developed an apprenticeship program that, over four years, has turned more than 270 recent graduates into well-trained employees prepared to hold specialized positions. Once they are accepted into the program, apprentices are assigned to their own experienced mentors who will help them follow personalized development plans. For the first three months, the apprentice works in a variety of departments, acquiring basic skills and becoming familiar with food production. After deciding on an area of specialization, the apprentice spends another three months working in a department of his or her choice, with the goal of being placed in a permanent position. At the end of the program, the apprentice becomes a full-time employee, returns for further training, or pursues opportunities elsewhere.

Our Polish locations also offer a six-month career development program to cultivate skills in leadership, time management, public speaking, and financial management. To date, 40 managers have completed the program.

European Employees Earn “Brown Belts” at Iowa State University

Smithfield holds a three-week training program in Ames, Iowa, each year. A series of classroom courses, laboratory trainings, and visits to farms and processing facilities aims to help a select few managers from our international operations develop a global vision of Smithfield’s business and to deepen the knowledge of specific processes and technologies. Each participant’s training concludes with a written exam and a project presentation specific to his or her business unit. In 2016, 12 Romanian employees achieved “brown belt” status, and four more are expected to get theirs by 2017. Our Polish operations earned 51 “brown belts” between 2008 and 2015.

Health & Safety

Our Health & Safety Goal

- Reduce employee injury rates

Our Health & Safety Targets

- Meet or beat general manufacturing industry national average for injuries
- All safety leadership trained to 10-hour food industry training programs
- Achieve 25% employee engagement each year
- Score average of “B” on monthly safety scorecard

All of our safety policies align with national regulations and European Union directives, including those of the European Agency for Safety and Health at Work. In 2013, we implemented our [U.S. Employee Injury Prevention Management System \(EIPMS\)](#) at all of our Polish and Romanian operations while giving them the flexibility to adapt the program to their specific locations. We believe such flexibility fosters better program management and will

yield measureable results in the future.

All international operations can access the EIPMS website to review safety standards, study compliance policies and procedures, and upload safety metrics and program details into our companywide database. The consistent reporting framework allows us to make comparisons among facilities and will be critical in encouraging continuous improvement as the program matures.

Engaging and Empowering Our People to Manage Risk

Active engagement in formal safety processes improves health and safety program effectiveness. We encourage our employees to participate in safety program reviews and development of new systems, and we aim to achieve 25 percent engagement companywide each year. Many locations maintain employee safety teams, which can bring fresh perspectives on safety challenges and successes.

Engagement	2015	2016
Poland	15.6%	24.5%
Romania	34.0%	92.5%

In 2016, our Romanian health and safety professionals nearly tripled employee participation in monthly safety prevention team meetings designed to train and develop skills in areas such as safety inspections, hazard identification and risk assessment, accident and incident investigation, and emergency response. They also invited all employees to participate in regular safety inspections and to watch formal presentations covering several health and safety topics. In addition, we launched a new series of web-based training programs at our Romanian hog production operations.

Another way our Romanian operations increased participation was by encouraging employee involvement in the P.O.R.C. program:

P.O.R.C. stands for the following:

- “Prevenire” (Preventing accidents)
- “Observare” (Observing risks in all areas)
- “Reportare” (Reporting by all employees)
- “Corectare” (Correcting by the management system)

The program empowers employees to identify risks in several areas, including health and safety, biosecurity, animal welfare, environment, and food safety and quality. It aims to leverage our employees’ valuable insights into process improvements, improved compliance, increased certification and standardization, and optimized internal management procedures. Ultimately, these improvements should translate to new business opportunities and higher profits. Since 2012, the program has improved health and safety performance through nearly 3,900 reported observations from employees.

Our Polish hog production group also promotes employee engagement at all levels of the organization. The group holds monthly team meetings to review occupational risk, confined space work, and corporate policy. Select locations also undergo monthly audits to reinforce these trainings.

New Scorecard Designed for International Operations

Our operations in Poland and Romania have been using our U.S. monthly Safety Scorecard for years. While facilities regularly scored well on indicators related to safety management (e.g., completion of safety work orders by maintenance or employee engagement in safety activities), they

lagged in several indicators related to injury recovery (e.g., days away from work).

We recently recognized this is because the original scorecard—based on domestic U.S. regulatory standards—did not match European practices and cultural norms. To remedy this, we have adapted our international health and safety polices to ensure effective implementation in our European operations.

In 2016, international operations were able to exceed their target of “B” on monthly scorecards. Polish operations earned an average overall score of 93 percent. Romanian operations received 95 percent.

First, we created targets and metrics tailored to the international operations. This will help us better capture health and safety performance and allow for better comparisons over time. This, in turn, will help safety professionals discover best practices and improve performance.

Second, we created a new training module designed to teach our international locations how the EIPMS is implemented and to familiarize them with required operational controls. Every month, each business will audit itself to a new element of the EIPMS.

These new metrics and applied learning techniques should deepen our employees' understanding of the EIPMS, assure implementation of the operational controls, improve future compliance, and ensure data integrity.

¹ This figure includes only our Romanian and Polish operations.



Driving Value Across Our Company

At Smithfield, the concept of value creation underpins all that we do. We believe that financial stability and sustainability go hand in hand. Our sustainability strategies help us improve our company.

We seek to create value for our stakeholders, for our employees, and for our company as a whole. We work to better understand and identify the connections between the costs and benefits of our sustainability program and how they relate to our bottom line. We believe we can create greater value for each of our stakeholders by recognizing the intrinsic interconnections between our business objectives and our sustainability objectives. Sound governance and management principles and practices provide the foundations for our sustainability programs. These programs not only reflect our core values; they also help improve our company's performance.

Value Creation Across Our Operations

This table of 2016 examples illustrates some of the ways in which our sustainability programs create value for a wide range of stakeholders while simultaneously improving Smithfield's own performance. We use the term "value creation" broadly and think of it in ways that go beyond just our own company's value.

Animal Care

Treating animals with care isn't just the right thing to do; it's also the right thing to do for our business. The healthier our animals, the healthier our company. Our animal care management systems, policies, and procedures are designed to ensure the proper treatment of our hogs. Our animal care performance can influence our reputation and the relationships we have with customers and consumers. It can also influence production levels: Healthy animals are more resistant to disease and gain weight faster, and healthy sows have larger and stronger litters.

FOR EXAMPLE:

- Compliant with national standards and guidelines for animal care.
- Continued to convert housing for pregnant sows on company-owned farms in response to customer demand, reaching 87 percent completion by December 31, 2016.
- Made payments of \$358 million to contract growers in the U.S. and purchased \$1.49 billion in U.S. grain.

[Learn more about Value Creation in Animal Care](#)

Environment

Smithfield employees are doing their share to improve resource efficiency in countless ways, whether it is finding new projects that lower emissions, increase recycling, eliminate leaks, or reduce packaging.

FOR EXAMPLE:

- Announced an industry-leading goal to reduce absolute greenhouse gas (GHG) emissions 25 percent across our value chain by 2025.
- Worked with growers in North Carolina to encourage production of sorghum, which requires less water to grow than corn and helps insulate our operations from commodity price swings.
- Saved an estimated \$178 million in operating costs through environmental improvement awards projects since 2012.
- Our manure-to-energy project with Roeslein Alternative Energy should produce 2.2 billion cubic feet of renewable natural gas annually (enough to provide electricity for nearly 53,500 homes).
- Eight facilities have been certified as zero-waste-to-landfill by sending no solid waste to landfill for a 12-month period. Two more expected to be certified in 2017.
- Our partnership with Environmental Defense Fund, which helps farmers optimize fertilizer use when growing grains for animal feed, aims to reduce water pollution and GHG emissions and protect soil health.
- Our partnership with the Environmental Protection Agency in its Nutrient Recycling Challenge hopes to find cost-effective technologies that extract nutrients (nitrogen and/or phosphorus) from livestock manure and generate a marketable product.
- Continued to develop a new logistics strategy under "One Smithfield" that should dramatically improve efficiency while reducing our carbon footprint.

[Learn more about Value Creation in Environment](#)

Food Safety & Quality

Maintaining the highest food safety standards is essential for Smithfield's business, building value for our own company and for the retailers and vendors that sell our products in supermarkets and restaurants.

FOR EXAMPLE:

- Invested \$20 million in capital projects to improve food safety.
- 100 percent of applicable facilities certified to Global Food Safety Initiative.
- In early 2017, launched a line of pork products from hogs never fed antibiotics.
- Responding to customer interest, we had more than 100 reduced-sodium products in the marketplace at the end of 2016.

[Learn more about Value Creation in Food Safety & Quality](#)

Helping Communities

Smithfield creates value in the communities where we work in a number of ways. We provide jobs, pay taxes, and, in many places, underpin the economic vitality of the regions where our operations are located. We also add value to our communities through our initiatives related to hunger relief, education, and health and wellness. Through our cause marketing efforts in partnership with retailers, we generate funds for charities and raise awareness of issues such as food insecurity and the struggles of military families.

FOR EXAMPLE:

- Donated 17.6 million servings of food across the U.S. and made \$7.7 million in overall cash donations in 2016.
- In early 2017, made a \$3 million donation to Isle of Wight County Schools in Smithfield, Virginia.
- Held about 140 cause marketing events around the country, up from 100 events the previous year.
- Awarded 95 scholarships (totaling nearly \$400,000) to students who are dependents of Smithfield employees.
- Provided more than \$213,000 for 393 scholarships to Polish students.

[Learn more about Value Creation in Helping Communities](#) and [International Operations](#)

People

We create value through the employment of 52,000 people, many of them in rural areas where there are limited job opportunities. Our operations also contribute to the economic stability and development of local communities, where we purchase goods and services and where employees reside.

FOR EXAMPLE:

- Announced a new initiative to employ 4,000 military veterans, or 10 percent of our domestic workforce, by the end of 2020.
- Reduced employee injury rate by more than 40 percent since 2008.
- Contributed about \$735,000 in education programs to benefit employees and their offspring.
- Paid \$2.3 billion in salaries, wages, and benefits in 2015.

[Learn more about Value Creation in People](#)

Case Study: Becoming a Bioscience Company

Most typically, the name “Smithfield Foods” conjures images of bacon, hot dogs, and ribs. How about blood thinners, pancreatic enzymes, and regenerative medicine?

In fact, these are all areas that Smithfield is either currently involved in or actively pursuing. For many decades now, we have been harvesting much more than the meat from the hogs slaughtered at our processing plants. Most other parts of the animals, including pituitary and pancreas glands, skin, fat, blood, and bone, have been gathered for use in pharmaceuticals, pet food, fertilizers, biodiesel, and gelatin.

But in most instances, we were passing the byproducts on to a third-party middleman that sold them on for reuse, rather than working directly with companies that could turn those byproducts into something of value. We realized that we could be doing a lot more to create value for our own company and for others down the chain—from pharmaceutical companies developing medications to the patients who may ultimately benefit from them.

Enter [Smithfield Bioscience](#), a new Smithfield business launched in early 2017.

“We’re taking the bull by the horns now to capture value from the byproducts of our animals,” says Courtney Stanton, vice president of renewables and byproducts with [Smithfield Bioscience](#). “There’s a multi-billion-dollar market opportunity each year from these.”

The biggest opportunity, she says, is in pharmaceuticals. With only minimal equipment investments, Smithfield will soon be able to sell hog byproducts directly to pharma and biotech companies, as well as to university researchers working on the next big medical breakthroughs.

Perhaps the next “big thing” in medical innovation will be the ability to transplant hog livers, kidneys, and other organs into humans.

Stanton notes that Smithfield is uniquely positioned to capture the benefits of this industry in part because of our ability to trace pigs back to farms of origin—traceability being a key requirement in the pharmaceutical industry. Moreover, Smithfield’s widespread presence, with plants in key geographies around the country, positions us well for delivering hog organs and other parts that require some urgency in transport.

Over the last year, we have been building relationships with pharmaceutical companies and with several universities, including Harvard and Columbia Medical Schools and the University of Wisconsin, that are focused on hog genetics. We also have been working on a project with the Department of Defense, which is developing technology using hog cell regeneration to repair damaged cells, tissue, and organs in wounded soldiers.

Perhaps the next “big thing” in medical innovation will be the ability to transplant hog livers, kidneys, and other organs into humans. Already, doctors are using pig valves to replace damaged heart valves in cardiac patients. It may not be long now before entire porcine organs will be able to be transplanted into humans. And Smithfield wants to be a part of that should it come to fruition. Smithfield is the only pork company in the Advanced Regenerative Manufacturing Institute, a consortium currently exploring xenotransplantation, or cross-species transplants, between hogs and humans.

“The goal of the consortium is to move this along within the next five to seven years,” Stanton says. “All of the technologies are out there—it’s about bringing the right parties together to make it happen.”

Smithfield created the new [Smithfield Bioscience](#) wing to demonstrate that we’re serious about the value of hog byproducts and that we can be an important player in this space. The new entity also clearly delineates the bioscience part of the business from our food operations.

“We found that folks can get a little bit spooked by the idea that we are gene splicing or doing funny things with the meat,” Stanton quips. “That’s not at all what we’re doing. None of these byproducts go into the food supply chain.”